
Non-Auto Travel in the Vancouver-Lillooet Corridor

December 1999



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Prepared for the
Ministry of Transportation and Highways

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Executive Summary

The Ministry of Transportation and Highways has embarked on a review of development options for all modes of transportation in the Highway 99 corridor between Horseshoe Bay and the Highway 97/99 junction north of Cache Creek. As one component of the corridor study, this report describes non-auto travel between Vancouver and Lillooet and the rail, bus, air and marine services in the corridor. It is intended as input to a more in-depth analysis of transportation needs and alternative ways of responding to those needs.

Travel in the Vancouver-Lillooet corridor is dominated by the automobile, but the other travel modes handle a substantial volume of traffic. This is apparent from the fact that 35 to 40 percent of skiers travel to Whistler by bus or rail. Detailed travel data is not available, but it appears that, over the full year, about 12 percent of long-haul travel in the corridor is non-auto travel.

The corridor is served by eight scheduled services as well as a transit connection to Lions Bay. Four of the services are actually tourist attractions that draw visitors into the corridor but do not serve a true transportation function. The remaining services play a transportation role and provide an alternative to the automobile. The main features of these services are highlighted in the following overview of scheduled rail, bus, marine and air connections to corridor communities.

Scheduled Passenger Services

	Service		Season		Trips per Day	Max. Daily Passenger Capacity (1 way)	Role
			Year-mtd.	Summer Only			
Rail	Van. - Pr. George (<i>Cariboo Prospector</i>)	N. Van.- Lillooet & beyond	•		1	292	Serves a diverse market, from local to long-haul travel in the Hwy. 99/97 corridors.
	Whistler Explorer	Whistler - Kelly Lake		•	1	178	Primarily aimed at motor coach tour traffic.
	BC Rail steam train	Van. - Squamish		•	1		An attraction in its own right, does not function as a transport service.
	BC Rail dinner train	Van. - Porteau Cove		•	1		An attraction in its own right, does not function as a transport service.
Bus	From Pacific Central Stn.	Van. - Mt. Curie	•		6 - 7	380+	Links 9 corridor communities to Van.
	From Van. Intern'l. Airport	Van. - Whistler	•		5 - 11	600+	Links Van. International Airport to Whistler.
	Public Transit	Lions Bay, Squamish & Whistler	•		3 from Lions Bay		Links Lions Bay to Van. and provides local mobility in Squamish and Whistler
Marine	Downtown to downtown	Van. - Squamish		•	1	300	Functions as an attraction rather than a transportation service.
Air	Floatplane from downtown Van.	Van. - Whistler		•	2	12	Links Whistler to downtown Van.

In addition to these scheduled services, a number of carriers provide charter services in the corridor.

The main features of the four principal services are outlined below.

Rail. BC Rail's primary service is the *Cariboo Prospector* - a daily service that operates the full length of the corridor and serves 26 points between North Vancouver and Lillooet en route to Prince

George. The service is constrained by a number of factors including track alignment, the 13-hour run to Prince George, and railcars that are more than 40 years old and near the end of their service life. The number of passengers using the service has declined – dropping from a peak of about 105,000 in 1992 to 60,000 in 1998.

Bus. Buses are the primary non-auto travel mode in the corridor at the present time. Greyhound Canada provides seven trips per day between Vancouver and Whistler during the winter months, plus an additional commuter-oriented trip from Squamish to Whistler. Four of these runs continue to Pemberton and one to Mount Currie. About half of the passengers on this service are Lower Mainland residents. The remainder are visitors from other points in Canada, the U.S., and overseas.

Perimeter Transportation Ltd. operates a scheduled service to Whistler from Vancouver International Airport under an exclusive contract with the airport authority. Service frequency ranges from 5 trips per day during the summer months to 11 per day on winter weekends.

Several carriers provide charter bus services in the corridor. School trips to Whistler represent the largest single charter market, but motor coach tours and convention groups also generate a substantial volume of charter bus activity.

No data is available on the size of the bus market in the corridor, but it appears that current volume is in excess of 600,000 passengers per year and may be as high as 900,000.

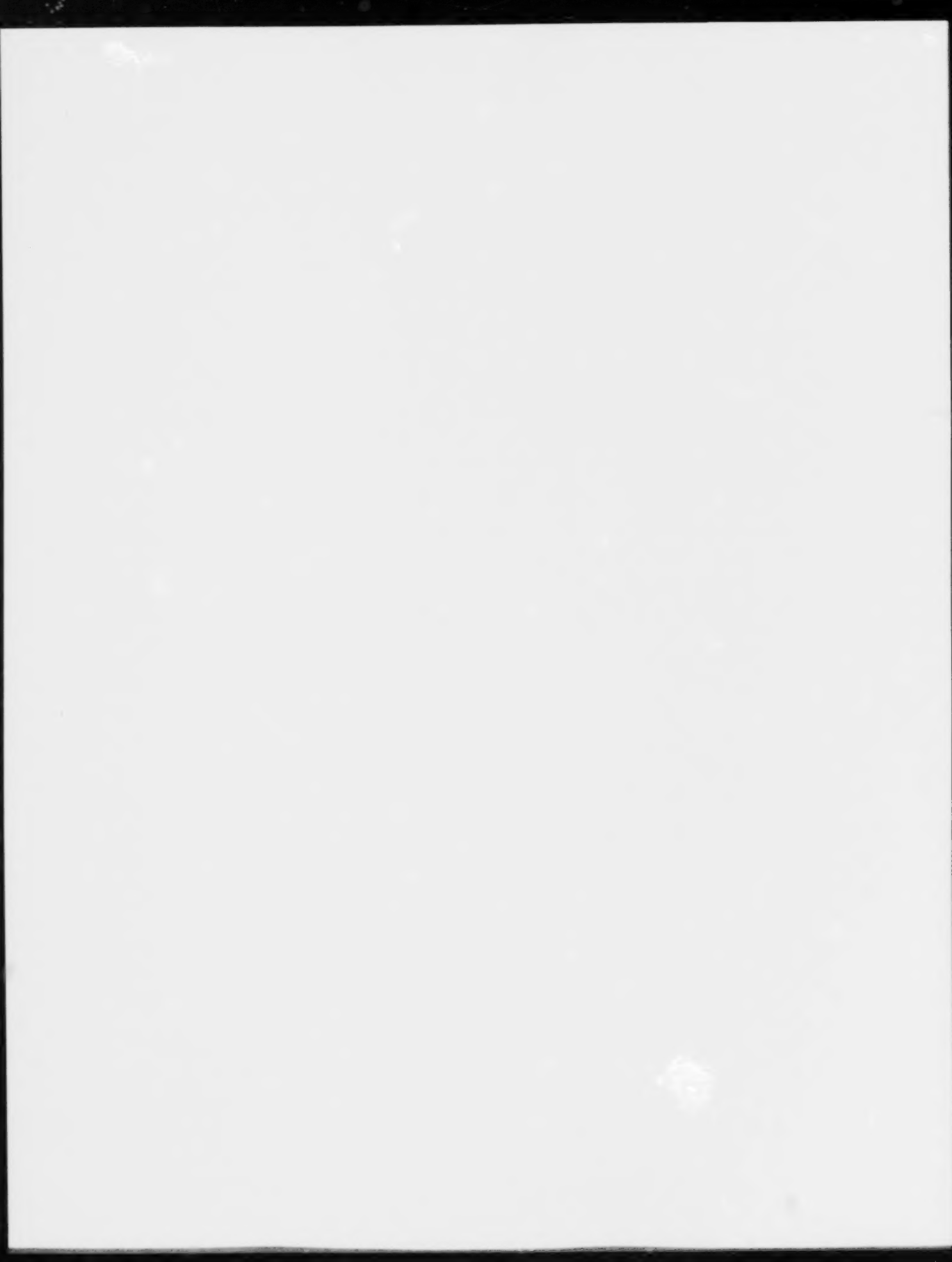
Air. Whistler Air Services operate the only scheduled airline service in the corridor. This is a seasonal floatplane service from downtown Vancouver to Green Lake in Whistler. It operates during the summer season only, since snow and ice conditions on the lake make it impossible to operate on skis during the winter months. The service has been operating for only two years, and it is not yet clear whether it can be sustained.

Current Trends. Performance of the non-auto modes has been mixed. The rail market has declined sharply over the last 7 or 8 years, and this decline is likely to continue unless steps are taken to revitalize the service. The only marine carrier in the corridor operates a tour attraction rather than a transportation service but has also seen a decline in traffic volume. On the other hand, the market for bus transportation is expanding and the carriers are expected to make incremental improvements as traffic volumes increase.

Planned Development. BC Rail, the bus operators and the airlines are continually fine-tuning their operations to respond to traffic growth, competition and the need to renew their fleets and facilities. As important as they are, those efforts will have little effect on the primary constraints on non-auto travel. There are, however, a small number of active or planned developments that have the potential to affect mode choice. These include the following projects and proposals.

- Rebuilding the BC Rail passenger fleet. BC Rail's equipment is near the end of its practical service life, and the railway will be forced to discontinue its passenger service unless the railcars are rebuilt or replaced within the next five years. The *Cariboo Prospector* is a non-commercial service that is maintained as a matter of public policy with an annual loss of about \$4 million. As a result, BC Rail is not prepared to cover the cost of equipment renewal, and has approached the Province for capital funding and re-instatement of operating subsidies.
- Building a Transportation Centre in Whistler. Whistler plans to build a transportation centre for buses and taxis by 2005. The transportation centre concept is currently being reviewed and refined, recognizing that the location and design of the facility will have implications for service quality and the volume of shuttle bus traffic in the Village.

-
- Establishing Scheduled Air Service to Pemberton. Prime Air Inc. has built a terminal at Pemberton Airport and is in the process of raising capital for additional airport improvements and a scheduled airline service to Pemberton from Vancouver and Seattle. The company has been attempting to establish a service for several years, and it is not yet clear whether its efforts will be successful.
 - Expanded Public Transit. BC Transit and the Village of Whistler have adopted a transit development plan that responds to the rapid growth in ridership that has been experienced in recent years. However, that expansion is focused on serving the local community rather than establishing new corridor links. At the present time there are no plans to improve the Horseshoe Bay-Lions Bay service or introduce new services between corridor communities.



Non-Auto Travel in the Vancouver-Lillooet Corridor

1. Introduction

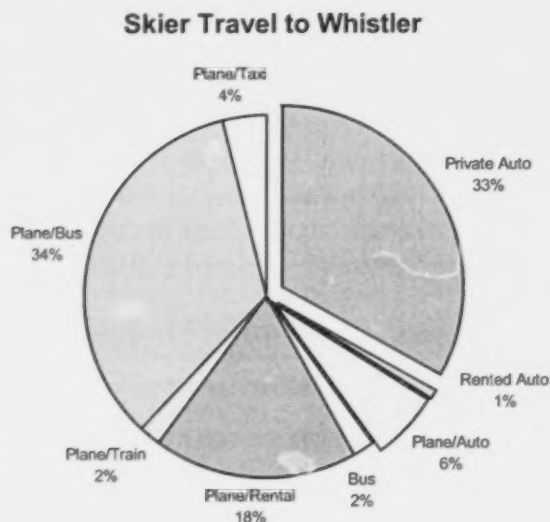
The Ministry of Transportation and Highways has embarked on a comprehensive study of development potential for all modes of transportation in the Highway 99 corridor between Horseshoe Bay and the junction with Highway 97 north of Cache Creek. As one component of that study, this report describes non-auto travel in the Horseshoe Bay-Lillooet section of the corridor and the rail, bus, air and marine services that link corridor communities to the Lower Mainland and the rest of the Province. The report is intended as input to an in-depth analysis of transportation needs and possible ways of responding to those needs.

The main body of the report is organized in four sections.

- Existing passenger **transportation services** are discussed in Section 2.
- **Travel characteristics** are addressed in Section 3
- The **strengths and limitations** of the existing system are reviewed in Section 4.
- Current **development plans** are addressed in Section 5.

2. Existing Transportation Services

The automobile dominates travel in the Vancouver-Lillooet corridor. However, the non-auto modes also handle a substantial volume of traffic. This is apparent from the way visitors travel to Whistler during the winter months. As shown below, the private automobile accounts for about 40 percent of skier travel to and from Whistler. Rental vehicles account for another 20 percent. The remaining 40 percent of visitors reach Whistler by bus, train, taxi, or limousine. More than half of the visitors captured in this survey arrive in Vancouver or Seattle by air and continue to Whistler by car, bus, train or taxi.¹



The role of non-auto travel is also apparent from classification counts carried out for the Ministry of Transportation and Highways. As shown in the following table, it appears that buses account for more than 30 percent of person trips for much of the day and during peak periods during the winter season. Classification counts for a Wednesday and a Saturday at the end of March showed results that are similar to those shown here for a Saturday early in March.

1. From a survey conducted by the Whistler Resort Association between the beginning of December, 1998 and the end of April, 1999. This is an uncontrolled survey that is carried out by roving interviewers in restaurant and cafeteria areas on Whistler and Blackcomb Mountains. Rail (at 0.3 percent of the total) and taxi/limousine services (at 0.1 percent) are not included in the chart.

**Results of Classification Surveys on Highway 99
North of Squamish (at Alice Lake Road)
Saturday, March 6, 1999**

Time Period	Vehicle Traffic		Passenger Traffic		Mode Split
	Autos, Vans and Limos	Buses	By Auto, Van and Limo ¹	By Bus ²	
Northbound					
7 am to 9 am	1,391	39	2,733	1,365	33%
Noon to 2 pm	566	11	1,120	385	26%
4 pm to 7 pm	904	26	1,751	910	34%
Southbound					
7 am to 9 am	256	16	457	560	55%
Noon to 2 pm	429	10	768	350	31%
4 pm to 7 pm	1,847	46	3,594	1,610	31%

The traffic volume carried by each mode is discussed in Section 3 of this report. However, it is clear from these examples that the non-auto modes play a significant role in the corridor travel. The services that handle that traffic are described below.

Rail

Railway Services

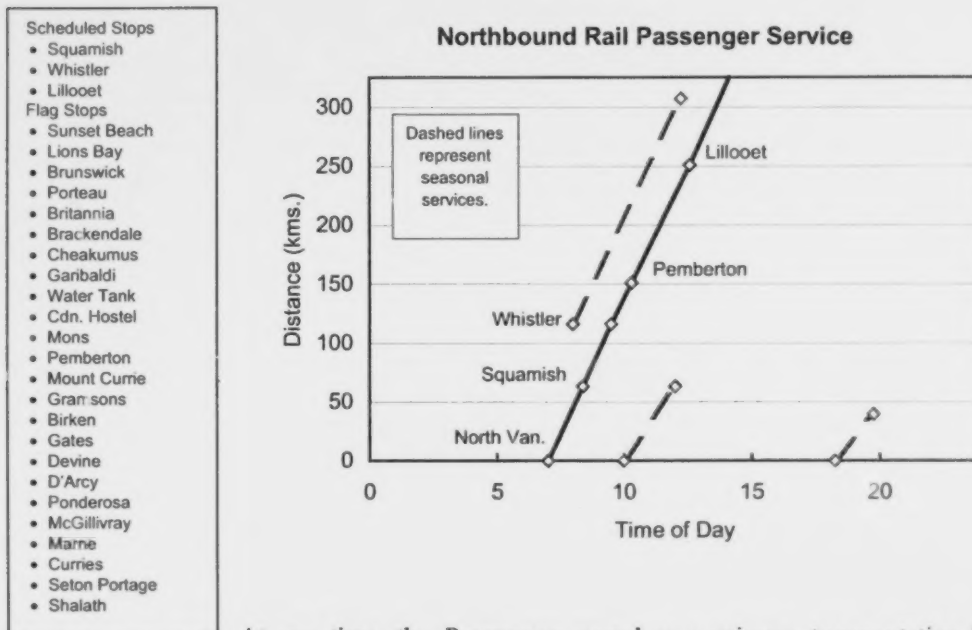
BC Rail operates four passenger services in the corridor. These trains serve diverse travel markets and range from a basic transportation service to a steam train and a dinner train that cater to tourism and entertainment markets. The main features of the BC Rail services are summarized in the following table.

Selected Features of Rail Service in the Corridor

Train	Primary Markets	Seasonality		Frequency			Food Service
		Yr.-Rnd.	Seasonal	Daily	5/week	3/week	
<i>Cariboo Prospector</i>							
Lillooet and south	Mixed	●		●			●
North of Lillooet	Mixed	●				●	●
<i>Whistler Explorer</i>	Tourists		●		●		●
<i>Royal Hudson</i>	Tourists		●		●		●
<i>Pacific Starlight</i>	Tourists/ Dining		●		●		●

1. Assumes that all vehicles recorded as carrying four or more passengers are actually carrying four people and that limousines carry an average of two passengers.
2. Assumes an average of 35 passengers per bus. Coaches typically can carry 47 to 50 passengers. An average load of 35 passengers is consistent with: an average capacity of 47 seats; a 50:50 split of scheduled and chartered buses; chartered buses operating full; and scheduled buses operating with half loads.

The *Cariboo Prospector* is a year-round service that operates between North Vancouver and Lillooet every day of the week and continues to Prince George three times each week. The schedule for the northbound train is shown in the following chart, together with those for BC Rail's three seasonal trains. The *Prospector* leaves the BC Rail station in North Vancouver at 7:00 a.m. to arrive in Squamish about 1 hour and 20 minutes later and in Whistler about 2½ hours later. There are scheduled stops in Squamish, Whistler and Lillooet and "flag stops" at 24 intermediate points.



At one time, the *Prospector* served as a primary transportation link through Squamish to the interior of the province. Its role changed as the provincial highway system was extended and upgraded, and the train is now primarily directed to tourism. BC Rail offers a number of travel packages that combine motor coach tours and resort and recreation packages with travel on the *Prospector*.

Self-propelled rail diesel cars (RDC's) are used for the *Prospector*, and the current schedule relies on the acceleration/deceleration capability of those cars. With the sharp curves and large number of at-grade crossings that are a feature of the line, conventional locomotive-hauled passenger trains could not maintain the current schedule.¹

1. Conventional equipment would increase the running time between North Vancouver and Whistler from 2 hours and 34 minutes to about 3 hours (*Pre-Feasibility Study for a New Passenger Rail Service from Vancouver to Whistler using West Coast Express Rolling Stock*, West Coast Express, December 1997).

There are eight operational RDC's in the BC Rail fleet.¹ The cars are now more than 40 years old, are difficult and expensive to maintain, and are at or near the end of their service life. A decision will be needed in the near future on whether to continue the service and, if so, whether to rebuild existing equipment or purchase replacement cars.

The *Whistler Explorer* operates between Whistler and Kelly Lake, about 55 kilometers north of Lillooet. The *Explorer* was introduced in 1995 as a more efficient way of handling motor coach traffic that had been carried on the *Prospector*.² Most passengers on the *Explorer* are on extended motor coach tours. Typically, these are two-week circle tours from Vancouver, Calgary or Seattle, extending through the Rocky Mountains and southern B.C. While the passengers travel by rail between Whistler and Kelly Lake, their motor coach "dead heads" with their luggage.

The *Explorer* completes a round trip every weekday from the end of May to the beginning of October. Like the *Prospector*, the *Explorer* draws from BC Rail's fleet of 40- to 50-year old RDC's.

The *Royal Hudson* is a tourist-oriented train that has been operating between North Vancouver and Squamish for the last 25 years. The train operates five days each week, starting at the beginning of June and running to the third week of September. The service is promoted with a Vancouver-Squamish boat cruise operated by Harbour Ferries, and passengers have the option of travelling one way by rail and the

1. Seating capacity on the eight cars is summarized in the following table. As shown, five of the cars are usually used on the *Prospector* and three on the *Explorer*.

Unit Number	Unit Type Designation	Seating Capacity on the <i>Prospector</i>	Seating Capacity on the <i>Explorer</i>
BC-10	RDC-1		66
BC-11	RDC-1		66
BC-14	RDC-1	64	
BC-15	RDC-1	68	
BC-21	RDC-2		70
BC-30	RDC-3	42	
BC-31	RDC-3	42	
BC-33	RDC-3	42	
Total		258	202

BC Rail has two additional units that are not serviceable. BC-12 was damaged in an accident and is in storage. BC-16 is a hulk that has not been in service for several years and is being used for parts.

2. Tour operators transfer passengers from motor coach to rail for the trip from Kelly Lake to Whistler, creating a relatively high demand on a short section of the line. Before the *Explorer* was established, BC Rail put extra cars on the *Prospector* to handle this traffic and ran them over the full length of the line to Prince George.

other by boat. In Squamish, the *Royal Hudson* uses an industrial spur that runs along the south edge of the downtown area, near the Harbour Ferries wharf.

The railcars that are currently being used on the *Royal Hudson* were acquired from VIA Rail and put into service 2 or 3 years ago with as little repair and refurbishing as possible. The cars now need more extensive refurbishing and BC Rail has recently called for tenders on that work.

The *Pacific Starlight* is a dinner train that runs from North Vancouver to Porteau and return, five days a week from early May to the beginning of October.¹ The train is made up of nine vintage railcars and has been operating since 1997.

Although specific financial information is not available for the BC Rail passenger services, the three tourist-oriented services are currently operating at or near the break-even point. On the other hand, the *Prospector* operates with a loss of about \$4 million per year. The service was subsidized by the Province from the early 1980's to 1993, but the losses that have since been incurred have been covered from the Railway's general revenue.

Ski Trains

BC Rail has made two attempts to operate ski trains to Whistler. It initially operated a Saturday morning train that left the North Vancouver terminal at 6:30 a.m. – or one hour before the *Prospector*. The results were disappointing. The railway then ran a ski train on Friday evenings during the 1991/92 season. Again, traffic volumes were so low that the service could not be justified.

Following its attempts to market and operate a Whistler ski train, BC Rail re-scheduled the *Prospector* to leave North Vancouver at 7:00 a.m. in an effort to meet skiers' travel needs. The 7:00 a.m. departure is still in place, and the train now arrives in Whistler at 9:34 a.m. and begins the return trip at 6:10 p.m.

Infrastructure

Passenger train operations are limited by several aspects of the rail line. These include:

- Track alignment, particularly where curves and grades limit operating speed.
- Passing opportunities – the length and location of sidings that allow passenger trains to pass freight traffic.
- At-grade crossings and the effect of limited sight distance on train speeds.

1. Porteau is mid-way between Horseshoe Bay and Squamish on the BC Rail line and about 20 kilometres south of Squamish.

- Station locations, platform length, and station platforms that are on the main track rather than separate station trackage.

As shown below, the maximum speed for RDC's on the North Vancouver-Whistler section of the line is generally between 30 and 45 miles per hour. This is 5 to 15 mph higher than the maximum allowable speed for other equipment.

Maximum Speed Limits Between North Vancouver and Whistler

Track Section		Maximum Speed (mph)	
From milepost:	To:	RDC's	Other Trains and Engines
1.4 (North Van.)			
3.5	10.9	30	20
10.9	29.2	40	25
29.2	29.3	15§	15§
29.3	31.0	40	25
31.0	31.5	30	25
31.5	37.3	40	25
37.3	42.0	45oc	25
42.0	42.4	45oc	35
42.4	Crossing	40‡	35
42.4	50.8	45oc	35
50.8	71.0	35	20*
71.0	73.7 (Whistler)	35oc	20*

oc On Curves

* Special instructions apply.

§ When track is seen to be clear, the preceding speed applies.

‡ Entering public crossing and until the crossing is fully occupied.

BC Rail's passenger trains operate from the North Vancouver station at the foot of Pemberton Street. Parking and terminal space is limited, but the platform can accommodate up to nine railcars. The station is relatively difficult to access because it is located on the North Shore and is beyond walking distance from the Sea Bus terminal or regular transit service. However, BC Rail charts a connecting TransLink bus during the peak summer season.

The Whistler station is located at the south end of Whistler, about 0.5 kilometres from the Creekside access to Whistler Mountain and 4.5 kilometres from the Village centre. It is located on a sharp curve and on mainline track. The platform has an asphalt surface, and the terminal building is an unheated shelter with very limited parking for buses and passenger pickup and drop-off. A shuttle bus operates between the station and the Village.

Service Reliability

Reliability is an important quality-of-service factor for all modes of transport, and BC Rail has particular difficulty adhering to the schedule for the *Prospector*. For the North Vancouver-Lillooet segment of the route, the accumulated delays are most severe for the southbound train towards the end of the 13-hour operating day.

On-time performance for the southbound train at Whistler is shown below.¹ As indicated, the train arrived within 15 minutes of the schedule roughly 55 percent of the time. It was more than 1 hour late 15 percent of the time.

**On-Time Performance of the Southbound
Prospector at Whistler**

On-time Performance	Percent of Arrivals at Whistler
On time (i.e. at 6:20 p.m.)	26.5%
0 – 15 minutes late	27.3%
15 – 30 minutes late	13.8%
30 – 45 minutes late	8.2%
45 – 60 minutes late	8.8%
More than 60 minutes late	15.5%

Performance varies with conditions. Within the 18-month period covered by this data, the worst period occurred in October and November, when the train was more than one hour late on 25 of 33 days and more than two hours late on 7 days. In June 1998, the train was more than one hour late on 11 of 25 days.

Intermodal Connections

Intermodal connections with BC Rail's passenger services are limited by station locations and operating schedules. The location of the North Vancouver terminal, for example, means that there are few opportunities for direct connection with other routes or modes. Similarly, the early morning departure from North Vancouver means that travellers who arrive in Vancouver by VIA Rail, Amtrak or air cannot continue to Whistler by rail without an overnight stay in Vancouver.

Existing intermodal links are summarized in the following table.

1. Data provided by BC Rail for a period of about 18 months, extending from January 1, 1998 to July 22, 1999.

Rail Intermodal Links

Station	Intermodal Links
North Vancouver	Chartered transit service to and from the terminal. ¹ Bayshore Inn shuttle for the <i>Royal Hudson/Harbour Ferries</i> tour.
Sunset Beach	This is the nearest stop to the Horseshoe Bay ferry terminal. The trip between the ferry terminal and the rail stop must be made by taxi or private vehicle.
Squamish	The track used by the <i>Royal Hudson</i> is adjacent to the Harbour Ferries wharf. Apart from taxis, there is no public transportation to the BC Rail station and the <i>Cariboo Prospector</i> .
Whistler	Shuttle bus from Whistler Station to and from Whistler Village and Greyhound's Village stop.
Pemberton	The station is centrally located in the Village and is near the Greyhound stop.
Lillooet	The station is centrally located in Lillooet.

Bus

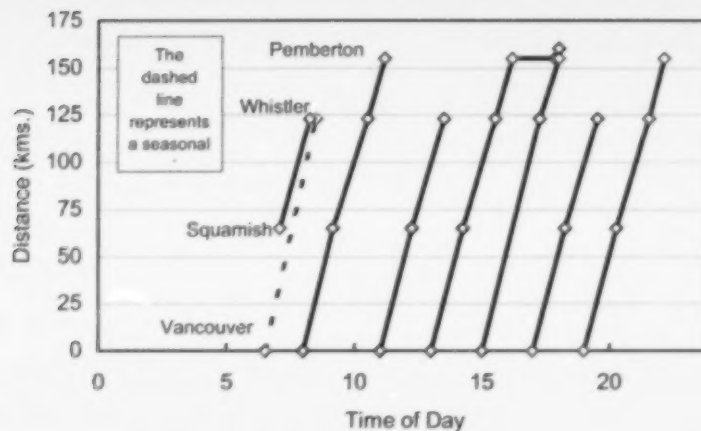
Bus is the dominant non-auto travel mode in the corridor. No traffic statistics are available, and carriers are reluctant to release information on their own business activity. Based on discussion with chartered and scheduled carriers, it appears that the bus industry moves more than 600,000 passengers per year in the corridor and possibly as many as 900,000 per year.

Vancouver – Whistler Scheduled Bus Service

Greyhound provides scheduled service between Pacific Central Station in Vancouver and Pemberton/Mt. Currie.² There is no scheduled service beyond Pemberton/Mt. Currie to Lillooet. As shown below, Greyhound operates six trips per day, year round, between Vancouver and Whistler. Four of those runs continue to Pemberton and one to Mount Currie. There is also an early morning run from Squamish to Whistler and a winter season express run from Vancouver.

-
1. This bus is chartered by BC Rail from TransLink and operates from June to mid-October. It leaves downtown Vancouver at 6:10 a.m. and follows the West Van bus route along Georgia Street. In the evening it waits for the *Prospector* to arrive before making the return trip to downtown Vancouver.
 2. Greyhound acquired the route from Maverick Coach Lines in December 1998 and has the right to use the Maverick name for 18 months.

Vancouver - Pemberton Northbound Service



- Service Points
- West Van.
 - Horseshoe Bay
 - Lions Bay
 - Britannia
 - Squamish
 - Dentville
 - Garibaldi Highlands
 - Brackendale
 - Pinecrest/Black Tusk
 - Whistler Creek
 - Whistler Village

Scheduled time from Vancouver to Whistler is 2 hours on express runs, 2¼ hours on limited-stop runs, and 2½ hours for regular service.

Service frequency has changed over the years as the operator adjusted the schedule to match traffic volumes and travel patterns. In 1987 it provided five round trips per day. By 1990, it was operating nine trips per day at seven departure times.¹ Frequency remains essentially the same today, with seven departures per day from Vancouver during the winter months and six per day for the rest of the year. Under that schedule, Greyhound provides basic capacity for about 115,000 passengers per year out of Vancouver, before accounting for extra sections. They often have to run a second bus, and it is not uncommon to use four buses at peak travel times. When extra sections are required, all but the last bus provide express service. This feature is not advertised, but regular users know that buses often operate on an express schedule.

As shown below, the Greyhound service is linked to several bus, ferry and rail services. The winter express service also includes hotel pickups in downtown Vancouver.

1. Two express buses left Vancouver at the same time as "all-stops" buses. (*Modal Share Review: Supplementary Report, Vancouver - Squamish Highway Planning and Pre-Design Engineering Study*, G.D. Hamilton & Associates, 1990.)

Greyhound's Principal Intermodal Links

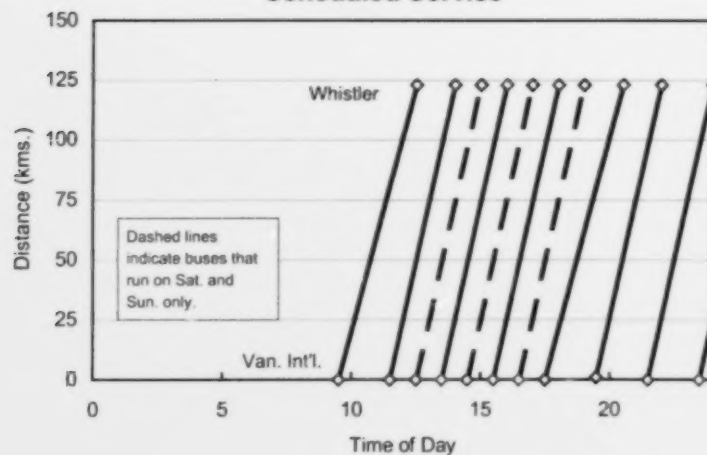
Station	Intermodal Links
Pacific Central Station	With the Skytrain system. With Greyhound service from other centres in Canada and the U.S. With four Quick Coach buses per day from Seattle-Tacoma Airport. With the Pacific Coach Lines service from Victoria. With VIA Rail's transcontinental service and the Amtrak rail and bus service to Seattle.
Horseshoe Bay	With bus service from Nanaimo and the Sunshine Coast.

There is no scheduled service to Lillooet. However, the taxi operator in Lillooet also operates two buses. These operate on a charter basis, including periodic trips to Kamloops. Those trips are used by local residents for shopping, attending to personal business, or travelling to medical appointments in Kamloops.

Vancouver International Airport – Whistler Scheduled Service

Perimeter Transportation Ltd. operates scheduled bus service between Vancouver International Airport (VIA) and Whistler, with pre-arranged stops at hotels in downtown Vancouver on some runs. As shown below, there are eight trips per day in each direction on weekdays during the winter months and eleven on weekends. Service drops back to five return trips per day through the rest of the year.

Vancouver International Airport - Whistler Scheduled Service



Daily Trips from Van. Int'l. Airport to Whistler

	Weekdays	Saturday and Sunday
Spring, summer and fall	5	5
Winter	8	11

As an airport connector, Perimeter serves visitors from across Canada, the U.S., Asia and Europe and has to design its schedule to provide the best overall match with aircraft arrivals and departures. The following table provides an indication of how well the bus and airline schedules match each other.¹

Integration of Bus and Airline Schedules Vancouver International Airport (VIA)

Market	Arrivals		Departures	
	Primary Flight Arrival Times	Connecting Buses	Primary Flight Departure Times	Connecting Buses
Canada	7:30 – 9:00	9:30	7:30 – 8:00	7:00
	10:30 – 11:45	11:30, 12:30	12:00	10:00, 11:30
	17:30 – 19:00	17:30, 19:30	16:00	14:00, 15:30
U.S.	11:00 – 13:00	11:30, 12:30, 13:30, 14:30	7:30 – 10:00	7:00, 9:00
	15:30 – 17:00	15:30, 16:30, 17:30	15:30 – 17:00	14:00, 15:30
	21:00 – 23:00	21:30, 23:30		
Asia	9:00 – 11:00	9:30, 11:30, 12:30	14:00 – 20:00	12:00, 13:30, 14:00, 15:30, 17:00
Europe	10:00 – 14:00	11:30, 12:30, 13:30	14:00 – 17:00	13:00, 13:30, 15:00, 16:30

Note: Italics indicate buses that operate on Saturday and Sunday only.

As indicated, Perimeter provides hourly service through most time periods when arriving and departing traffic from Vancouver International is heaviest. Considering the number of flights that are involved and the variations in processing times through Customs and Immigration, it appears that Perimeter provides good connections with airline flights during the winter months – particularly on weekends.

1. Airline arrival and departure times are from *Pre-feasibility Study for a New Passenger Rail Service from Vancouver to Whistler Using West Coast Express Rolling Stock*, West Coast Express, 1997. The original source is the Vancouver International Airport Authority. Bus arrival and departure times are from Perimeter's 1999/2000 winter schedule.

Volumes are lower during the summer months and consequently Perimeter operates on a reduced schedule and uses 11-passenger vans rather than motor coaches on about 75 percent of its trips. Service design also changes in the summer months. For example, Perimeter includes en route commentary and a stop at Shannon Falls as part of its summer service.

In busy periods, Perimeter's buses leave the airport as soon as they are full, rather than waiting for the scheduled departure time. On high-volume days, a bus leaves roughly every 20 minutes between 11:00 a.m. and 5:00 p.m.

Perimeter's own fleet can handle normal traffic volumes during the week. However, it charts coaches from other carriers to handle overload traffic. Sixty to 65 coaches are required to handle the traffic load on a peak day.

Baggage capacity is an important factor on the airport service. At the present time, Perimeter carries a maximum of 47 passengers on its 55-seat buses and 35 passengers on 45-seat buses. Otherwise, there is not enough space for baggage. New buses that have recently been purchased by Perimeter have more baggage space per seat, making it possible to carry 56 passengers on a 56-seat bus.

Charter and Tour Operators

Several charter and tour operators operate in the corridor. These include: Maverick, Perimeter, Charter Bus Lines of BC, Gray Line (Laidlaw), International Stage Lines, and Wellstone Coach Lines. The following types of charter bus and motor coach tours operate in the corridor.

- Group charters from Vancouver and Vancouver International Airport, mainly to Whistler. School trips make up a large part of this activity.
- Local tours tied to other services such as the Harbour Ferries and Royal Hudson services to Squamish.
- Circle tours and extended motor coach tours over Highway 99 from Vancouver to Highway 97, including tours that extend through B.C. to Banff and Jasper.
- Multi-modal motor coach tours, including those that make use of BC Rail's *Whistler Express* service from Whistler, through Lillooet, to Kelly Lake.

Regulation

Greyhound and Perimeter operate their scheduled services under license authority granted by the Motor Carrier Commission. Those licenses give the carriers exclusive rights to provide the following services:

-
- Greyhound – scheduled service from Pacific Central Station in downtown Vancouver to specific service points in the Vancouver-Mount Currie corridor, with scheduled pick-up at Vancouver hotels.
 - Perimeter – scheduled service from Vancouver International Airport to Whistler, with pre-arranged hotel stops in Vancouver and regular stops at Whistler hotels.

Scheduled carriers must obtain the Motor Carrier Commission's consent to any change in service points or operating schedules. Both scheduled and charter operators must have the Commission's approval for tariff changes and must meet certain requirements to give the general public and municipalities advance notice of rate changes.

There have been several calls for competition on bus service to Whistler. It appears that this reflects concern about the rates that are charged on Perimeter's airport service. Apart from this concern, it appears that the Greyhound and Perimeter services are well regarded.¹

Regulation of the inter-city bus industry is similar to truck regulation that was in effect until the late 1980's, where operators were granted exclusive rights to certain routes and markets. In the case of the trucking industry, the "deregulation" process was initiated by the federal government (under its authority over inter-provincial trucking) and by those provinces that favour a regulatory regime that promotes competition.

Deregulation of the inter-city bus industry has been under debate for several years, and is likely to occur within the next 10 to 15 years. The federal government recently introduced legislation that would "deregulate" inter-provincial and international bus service over a 2-year period.² The Bill died when Parliament was prorogued in September 1999, and the Minister has since referred the proposed changes in bus regulation to a parliamentary committee rather than re-introducing the legislation.³

Under the proposed regulatory regime, extra-provincial carriers would no longer have exclusive operating rights, and competing bus operators would be free to enter the market provided they meet prescribed safety standards. Over the longer run, this could lead to de-regulation of intra-provincial bus services. In fact, if they were to follow the same approach as they did with the trucking industry, federal authorities

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1. The adult rate from Vancouver International is about \$47 each way or \$29 more than Greyhound's rate from downtown Vancouver. This difference is high enough that some travellers take the airporter service to downtown Vancouver to connect with the Greyhound service. Others travel to Whistler with Perimeter and make the return trip with Greyhound. Many of Perimeter's customers purchase their bus transportation as part of a package and consequently are unaware of bus transportation costs.
 2. These changes were introduced to the House of Commons on March 25, 1999 as part of a package of amendments to the *Motor Vehicle Transport Act*.
 3. News release issued on September 28, 1999.

would put pressure on British Columbia and the other provinces to follow their lead. As one of the few expanding markets for bus service, Whistler and the Highway 99 corridor would attract strong interest from other carriers if regulatory restrictions were removed.

Ferry

There was no road or rail access from Vancouver to Squamish until the late 1950's and consequently all passengers and all BC Rail freight were transported to Squamish by ship. Those marine services were discontinued once the Sea-to-Sky Highway and the southernmost section of the BC Rail line were completed, and a seasonal scenic cruise from Vancouver to Squamish is the only remaining marine link along the corridor.

Ferry Services

Harbour Ferries make a return trip from Vancouver to Squamish, five days each week from mid-May to late September. The main features of the service are outlined below.

- The vessel used on the service is the M.V. Britannia II. The Britannia can carry 300 passengers, but apparently operates with an average load of about 100 passengers. At this level, the service would carry a total of about 8,000 passengers in each direction through the full operating season.
- The service is based in Coal Harbour (near the Bayshore Inn). In Squamish the ferry docks at a float in Mamquam Blind Channel, adjacent to the track and terminal area used by BC Rail's Royal Hudson steam train.
- Travel time is about 3 hours in each direction.
- Travellers have several options. These include: (1) taking a two-way trip on the Britannia II; (2) travelling by boat in one direction and train in the other; or (3) buying one of several tour packages that include river rafting, motor coach tours, and overnight stays in Whistler.

Four other ferry services in Howe Sound are of interest:

- Western Pulp Limited operates a scheduled service between Darrell Bay (4 kms. south of Squamish) and Woodfibre. This service is provided for workers at the Woodfibre pulp mill, but is also available to the general public on a limited basis. The terminal at Darrell Bay could be developed for other ferry operations.
- The BC Ferry services from Horseshoe Bay are of interest because they link the Highway 99 corridor with Vancouver Island, the Sunshine Coast, and island communities in Howe Sound.
- The Regent Navigation service from Gibsons Landing (on the Sunshine Coast) to downtown Vancouver provides one indication of the type of service that might be

provided for Squamish. This service is designed for the commuter market and has been operating for two years. At the Vancouver end of the trip, Regent uses an outside berth at the Seabus terminal. This location provides direct access to the Seabus and Skytrain systems and is within easy walking distance of much of the downtown area. The operator hopes to add two boats to the fleet and reduce trip time from one hour to about 40 minutes.

The main features of these services are outlined in the following table.

Selected Howe Sound Ferry Services

Operator	Harbour Ferries	BC Ferry Corporation		Regent Navigation	Western Pulp Limited
Service	Van. - Squamish boat cruise 1/day, 5 days per week, mid-May to mid-Sept.	Van. Island - Horseshoe Bay 8/day (spring)	Sunshine Coast - Horseshoe Bay 8/day (spring)	Sunshine Coast - Vancouver 1/weekday	Squamish - Woodfibre 10/day
Crossing Time	3 hours	1 hour	40 mins.	1 hour	30 mins.
Terminal Locations	Vancouver (Coal Harbour) Downtown Squamish (Mamquam Blind Channel)	Nanaimo (Departure Bay) Horseshoe Bay	Langdale Horseshoe Bay	Gibsons Landing South Shore Seabus Terminal	Darrell Bay Woodfibre
Vessel	Britannia II (300 pass.)	Pacificat (1,000 pass.)	Queen of Surrey (1,466 pass.)	Georgia Master (38 pass.)	Garibaldi II
Annual Ridership (one way riders)	16,000		1.5 million	16,000	
Intermodal connections	At Squamish: motor coach tours, Royal Hudson steam train.	At Horseshoe Bay: with Greyhound. (No connection with northbound trains on the current schedule.)	At Horseshoe Bay: with Greyhound. (No connection with n/b trains on the current schedule.)	Seabus and Skytrain	None Linked to Squamish by public transit (1 trip in the morning and afternoon).
Other Features				Sponsored by the Gibsons IGA store. The operator hopes to add two vessels of 40 - 75 pass. capacity and a 42-min. trip time.	

Terminal Facilities

There are several marine terminals in the Squamish area in addition to the float and ramp that are used by Harbour Ferries.

- Darrell Bay. The ferry berth and terminal at Darrell Bay is used by Western Pulp Limited for their Woodfibre service. The berth is a timber structure that appears

to be in a poor state of repair. There are three parking lots in the terminal area with a total of about 265 parking spaces.

- **Porteau Cove.** The ferry terminal at Porteau Cove was developed for emergency use in the event that Highway 99 is closed for an extended period of time because of slides or other disruptions. The terminal is located in a marine park that is used by campers, day visitors and divers and is the end of the run for BC Rail's dinner train. The ferry berth is a steel and concrete structure that also serves as a plaza and walking area for park visitors. There are about 50 parking spaces in the terminal area, with 35 additional spaces in a nearby area of the park.
- **Other Marine Terminals.** There are several marine cargo terminals that are served by rail and might be considered for use as temporary ferry terminals. Squamish Terminals is a deepsea terminal for woodpulp exports from the B.C. interior and Alberta. It has two ship berths. There are shallow draft berths at a mill site and at the former Canadian Oxy site in Squamish. Two berths at Britannia Beach are in a state of disrepair.

Air Transport

With roughly 6,000 passengers per year between Vancouver and Whistler, air transportation plays a limited role in the corridor at the present time. While there is strong potential for future development, growth and operations are limited by flying conditions and limited navigation aids.

Airstrips and Helipads

There are three airstrips in the corridor – at Squamish, Pemberton and Lillooet. The facilities at each location are outlined in the following table.

Corridor Airstrips

	Squamish	Pemberton	Lillooet
Operator	District of Squamish	Village of Pemberton	Village of Lillooet
Runway Length	2,400 feet	4,000 feet	3,990 feet
Runway Width	75 feet	100 feet	75 feet
Runway Surface	Asphalt	Asphalt	Asphalt
Runway Lighting	None	None	None
Other Nav aids	None	None	None
Other Features	Noise abatement procedures. Limited winter maintenance.	No winter maintenance.	

All of the airports operate under visual flight rules. The approaches to Pemberton airport are severely restricted by mountainous terrain. Landing aids were installed at

the airport over a 3-year period between 1985 and 1988 as a demonstration project. However, those facilities were never certified by Transport Canada and the precision navigation equipment was removed from the site.¹

There are several other air transport facilities in the corridor. These include the municipal heliport in Whistler and the Pemberton Helicopters facility in Pemberton. Whistler Air Services operate a float plane base at the south end of Green Lake in Whistler.

Over the last 20 years, the Province has provided more than \$4 million in capital for airstrips and helipads in the corridor. The following table summarizes the provincial grants provided through the Air Transport Assistance Program.

Provincial Grants for Airport Improvements

Facility	Improvements	Period in which grants have been provided	Total Grants
Squamish Airport	• Runway reconstruction and paving. • Airport development plan.	1978 - 1989	\$75,000
Whistler Heliport	• Clear the site, grade the landing area, build access road. • Lay gravel base.	1991 - 1996	\$244,000
Pemberton Airport	• Upgrade apron, improve access, install fencing. • Install power and telephone. • Extend and pave the runway. • Install a microwave landing system. • Install a modular terminal building and services. • Repair runway, install helipad lights, and remove power poles.	1979 - 2000	\$2,060,000
Lillooet Airport	• Acquire land. • Design and construct the runway. • Pave the runway. • Install a modular terminal building and services. • Upgrade fuel facilities. • Seal runway cracks.	1978 - 2000	\$1,631,000

1. This was a demonstration project that was funded by the federal government. It used a microwave landing system (MLS) and specially-equipped Dash-7 aircraft to establish and demonstrate a steep instrument approach to the airport. The project faltered when the system developer lost a primary source of funding and Air BC -- the airline partner in the project -- sold the last of its Dash-7 aircraft.

Airline Services

Whistler Air Services Ltd. is the only airline that offers scheduled service in the corridor at the present time. This is a floatplane service that operates from a base on Green Lake in Whistler to the Harbour Air Terminal in Coal Harbour in downtown Vancouver. The service is an outgrowth of Whistler Air's charter operations and has been operating since 1998.

Whistler Air has two scheduled flights per day from the beginning of June to the end of September. As shown in the following tables, flying time from Vancouver to Whistler is 30 minutes.

Northbound to Whistler

a.m.	p.m.	
9:30	5:00	Vancouver
10:00	5:30	Whistler

Southbound to Vancouver

a.m.	p.m.	
8:30	4:00	Vancouver
9:00	4:30	Whistler

It appears that the scheduled service is not viable with current passenger volumes, and continued operation depends on the operator's ability to develop the market. As a summer season operation, the service relies on business and convention travel as well as tourist travel. The Coal Harbour terminal in Vancouver is close to downtown hotels and is accessible by car and taxi. It is also within walking distance of the Seabus and Skytrain terminals.

Both Vancouver Helicopters and Helijet Airways have operated scheduled helicopter service from Vancouver to Whistler in the past. Traffic volume apparently fell short of the levels required to sustain those operations. However, the industry has a continued interest in the market and one or more operators could re-enter the market with scheduled service in the future.

Several airlines offer charter services in the corridor – providing charter service between corridor communities, Vancouver International Airport, and downtown Vancouver as well as sight-seeing and heli-skiing services in the corridor. The market is mixed, and includes tourist, business and convention travel from Vancouver. The corporate convention business includes groups as large as 150 to 200 people travelling by air from Vancouver International Airport and downtown Vancouver to Whistler.

Public Transit

Public transit plays a limited role in regional and corridor travel at the present time. However, its contribution to corridor travel is likely to increase in the future.

Current corridor-oriented transit operations are outlined below.

Lions Bay

The Vancouver-Horseshoe Bay transit service is extended to Lions Bay on weekdays -- once in the morning and twice in the late afternoon. A park-and-ride facility in Lions Bay is also served by this route.

Squamish

The Squamish transit system operates with two buses and a Handi-Dart vehicle. Routes extend from the Valleycliffe area (southeast of downtown Squamish) to Brackendale and use a 3-kilometre section of Highway 99. There is also an early morning and late afternoon service to Darrell Bay for workers who are connecting with the ferry to Woodfibre.

Whistler

The Whistler transit system makes heavy use of Highway 99, with four of five routes operating on the highway. Those routes extend from 7 kms. south of Whistler Village to 7 kms. north of the Village on the highway.

All Whistler transit routes circulate through the Village and provide direct access to the Greyhound stop in the Village centre. The system is heavily used and carries more than one million passengers per year. Although skiing and social/recreational trips account for a large part of total ridership, travel to and from work accounts for 45 percent of riders and is the dominant trip purpose.¹

Pemberton

There is no transit service in Pemberton at the present time. However, a local operator apparently has applied for a motor carrier license and a recent survey carried out by BC Transit indicates that there is sufficient demand to support a service between Mount Currie, Pemberton and Whistler using a 14-passenger van.² The travel survey indicated that travel to work in Whistler peaks between 6:00 and 8:00 a.m. in the morning while return trips are concentrated between 4:00 p.m. and 6:00 p.m.

1. Based on surveys carried out in March, 1994 and 1996 (*Transit 2010 - Transit Expansion Plan for the Whistler Transit System - 1997-2010*, BC Transit).

2. The BC Transit assessment of market potential is based on surveys that were carried out in March 1999, with responses covering 20 to 25 percent of residents.

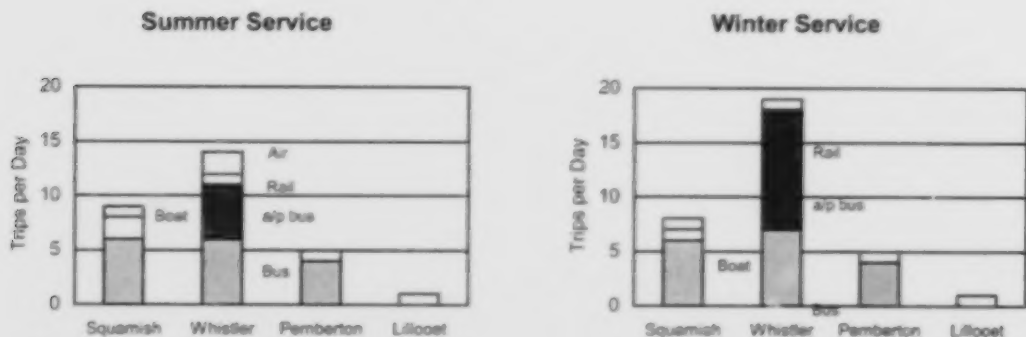
Lillooet

There is no public transit service in Lillooet. However, as noted earlier, the taxi operator provides a periodic service to Kamloops by van or bus.

Service Overview

Travellers take account of many factors when they decide when and how to travel. These include service frequency, reliability, comfort, baggage handling, schedule convenience, and cost. The importance that is attached to each of these factors depends on the purpose of the trip and the size and nature of the travel party. For example, commuters travelling alone between Squamish and Vancouver will have very different requirements than a family of four travelling from Vancouver to Whistler for a ski vacation.

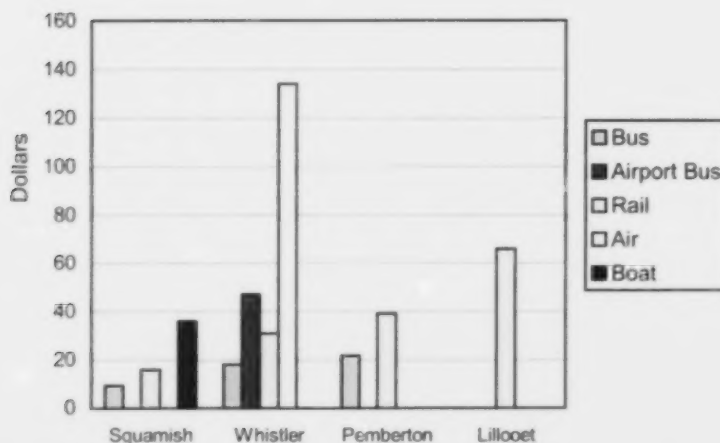
The standard of service that is available in the corridor varies from community to community. This is apparent from the frequency of service between Vancouver and corridor communities as shown in the following chart. As indicated, there are close to 20 scheduled trips per day between Vancouver and Whistler during the winter months while there is only a single trip to Lillooet.



Differences are also apparent in the following comparison of fares between Vancouver and the main communities in the corridor.¹ Rates from Vancouver to Whistler, for example, range from \$18 by bus to \$135 by air.

1. It should be noted that the rates shown here are not directly comparable. For example, the rail rate includes meals while the rate for other modes covers transportation only. Most rates are in effect throughout the year. However, summer rates for the airport bus are about 12 percent lower than the winter rate that is shown in the chart.

One-Way Adult Fares from Vancouver



Combining rates with travel time and the number of people travelling in a group, the following charts show how the non-auto modes compare for two illustrative trips – from downtown Vancouver to Squamish and Whistler. The charts assume that all members of a travel group are adults and travel time is valued at \$10 per hour.

The charts are intended to illustrate sensitivity to the factors that travellers account for as they make mode-choice decisions. For many trip types, travellers who are deciding whether to travel by car or some other means generally account for only the marginal costs of making the trip – the added expense they will incur by making a particular trip. For this illustration, the marginal (or perceived) cost includes fuel, oil, tire wear, and maintenance.

The charts also show the full average cost of travel by car, including insurance and depreciation. This is the cost that might be considered if someone were considering whether to commute by bus or buy a car that would be used primarily for travelling to and from work. The travel time costs are based on typical travel times in current conditions. The assumptions underlying the charts are set out in Appendix 1.

Van.-Squamish	
• For a party of two, the perceived cost of travelling by car is less than half the cost of bus.	
• Rail costs three times the perceived cost of auto.	
• For a party of two, relative costs are:	
Auto perceived	1
Full (avg.) auto	1.7
Bus	2.2
Rail	3.0



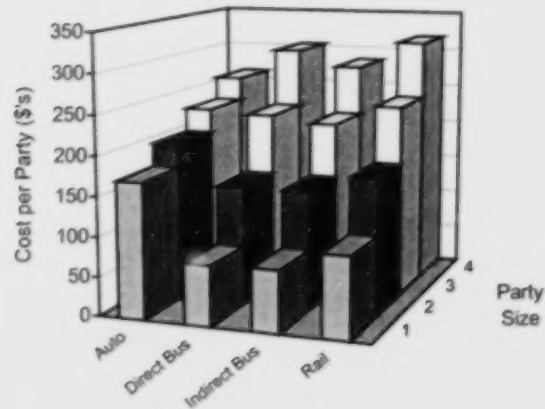
Van. - Whistler	
• For a party of two, relative costs are:	
Auto perceived	1
Full (avg.) auto	1.7
Bus	2.0
Rail	2.6
Air	5.2



Out-of-province visitors who arrive at Vancouver International Airport en route to Whistler have somewhat different options. They face additional costs in order to access the Greyhound service from downtown Vancouver or higher fares for Perimeter Transportation's airport-Whistler service. With the current rail schedule, they must stay overnight in Vancouver in order to travel to Whistler by train. Finally, they have the option of renting a car. As shown in the following chart, bus and rail are competitive with a rented car for travel between Vancouver International Airport and Whistler.

Vancouver International Airport - Whistler Travel Costs

- Van. Int'l. - Whistler
- For a party of two, the cost of car rentals, bus and rail are competitive.
 - A group of 2 can save 30% by taking the airporter and Greyhound service rather than Penmeter. However, that saving is offset by increased travel time.
 - Rail travel requires an overnight stay in Vancouver. The added cost of an overnight stay is not accounted for here.



Direct bus = Penmeter Transportation

Indirect bus = Airporter to Pacific Central Sta., Greyhound to Whistler

Air travel is not included in this illustration. However, the total cost for a party of two using the floatplane service to Whistler is about \$300 or roughly twice that for the other modes.

3. Travel Characteristics

The potential of rail, bus, air and marine transportation in the corridor depends as much on the nature of the travel market as it does on the design and standard of service offered by each mode. This section of the report highlights some of the key characteristics of travel in the Vancouver – Lillooet section of the Highway 99 corridor and the factors that influence mode choice.

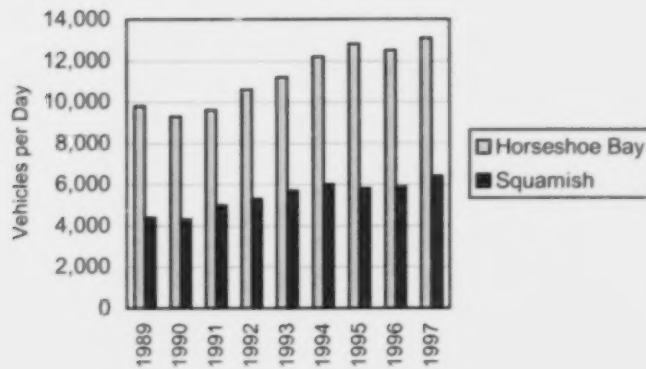
Traffic Patterns

Most trips in the corridor are by car. Although travel on Highway 99 is often affected by congestion, weather conditions and other factors, traffic is largely unconstrained. As a result, travel patterns on the Sea to Sky Highway provide a clear indication of travel demand characteristics such as the size of the groups that are travelling together, where their journeys begin and end, and the purpose of their trips. If rail, bus, air and marine carriers are to expand their share of the corridor travel market, they will have to address those travel needs and provide a standard of service that is competitive with the automobile in terms of cost, travel time, and convenience.

Average annual daily traffic (AADT) on Highway 99 has increased by about 30 percent over the last ten years. As shown below, two-way AADT immediately north of Horseshoe Bay has increased at a rate of about 500 per year -- equivalent to about 3½ percent of current traffic volumes. The same pattern of growth is evident immediately north of Squamish, where AADT has increased by about 250 each year or roughly half the growth at Horseshoe Bay. In this case, annual growth is equivalent to about 4 percent of the current volume.¹

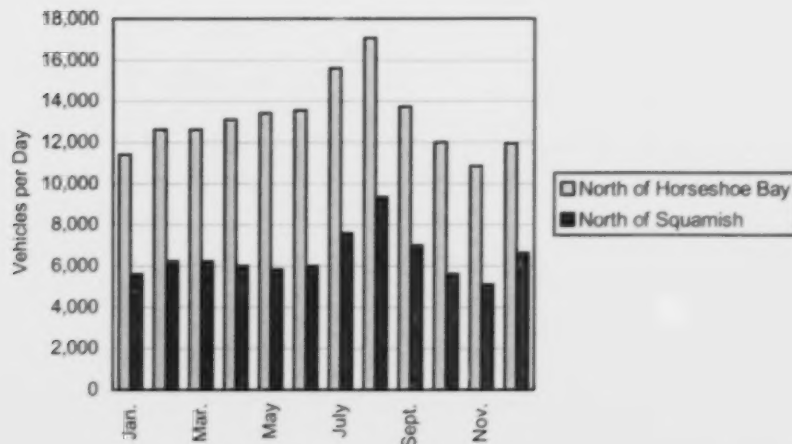
1. Data for Horseshoe Bay is from permanent count station P-15-5, located about 1 km. north of the junction of Highways 1 and 99 at Horseshoe Bay. Data for Squamish is from P-15-3, at the Cheekye Bridge, about 10 kms. north of Squamish. 1998 AADT's are not available for these locations. All figures are for two-way traffic.

Average Annual Daily Traffic



As shown in the following chart, traffic peaks in July and August with volumes that are roughly one third higher than winter volumes.¹ Measured on a monthly basis, traffic volume north of Horseshoe Bay is relatively steady from February to the end of June. North of Squamish, there is little change between December and June.

Monthly Average Daily Traffic - 1997

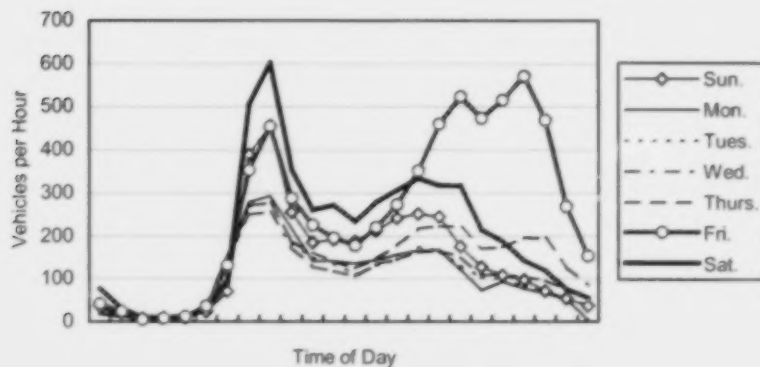


Although traffic is heaviest during the summer months, the highest hourly traffic volume occurs during the winter -- particularly in the late afternoon on Sunday when skiers are making their way back to Vancouver. This pattern is apparent in the following chart, which shows hourly traffic volumes on Highway 99 north of

1. No counts are available for some months in 1998.

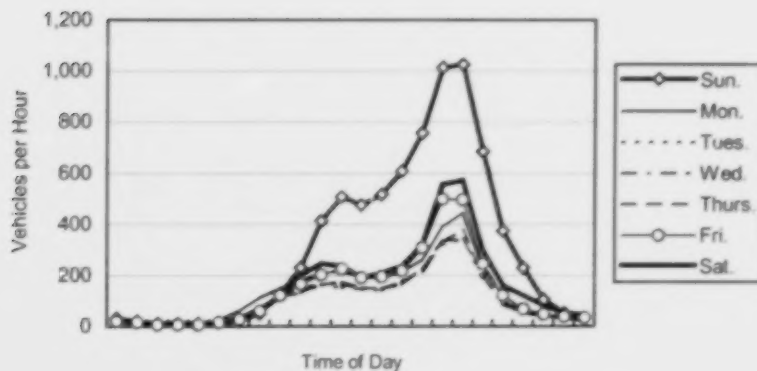
Squamish during the month of February.¹ Northbound traffic at this point on the highway peaks between 4:00 p.m. and 9:00 p.m. on Friday evening and again between 7:00 a.m. and 9:00 a.m. on Saturday morning. There is also a sharp peak on Friday and Sunday mornings.

Northbound Traffic North of Squamish
February 1998



As shown below, the heaviest volume in the southbound direction occurs between 4:00 p.m. and 6:00 p.m. on Sunday afternoons. This peak is 70 percent higher than the heaviest northbound volume, reflecting the heavy concentration of skiers making the return trip to Vancouver once the ski hills have been closed for the day.

Southbound Traffic North of Squamish
February 1998



1. Values are averages for the month of February, 1998 at permanent count station P-15-3, 10 kms. north of Squamish. For example, the value shown for the 9:00 a.m. to 10:00 a.m. period on Friday is the average for that time period for the four Fridays in that month.

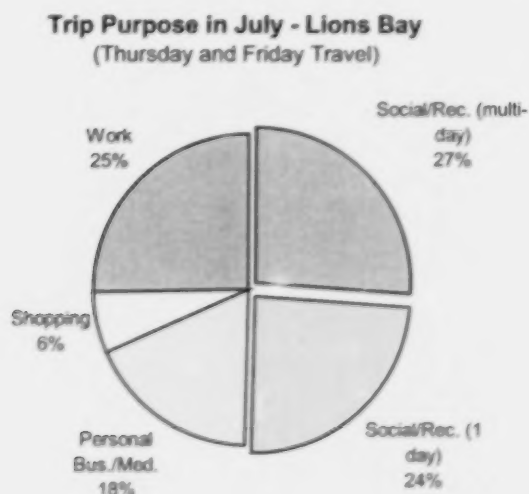
Trip Purpose and Origin-Destination Patterns

Where people begin and end their trips is an important consideration in the design of rail, bus, ferry and air transportation systems. Market potential for each of these modes depends in large part on how well the routes and services match origin-destination patterns, how easy it is to reach terminals and stations, and how many times a passenger has to transfer between routes or modes.

There is very little information on origin-destination patterns for travel in the corridor. Recent surveys carried out in Whistler concentrated on local travel, and the published results simply identify trips that start or end "south of Whistler" or "north of Whistler."¹

The Ministry of Transportation and Highways completed origin-destination surveys at Lions Bay and Whistler in July 1989 and north of Squamish in March 1991. While patterns have undoubtedly changed over the last ten years, the results of those surveys provide a useful indication of travel patterns during the summer and winter seasons.

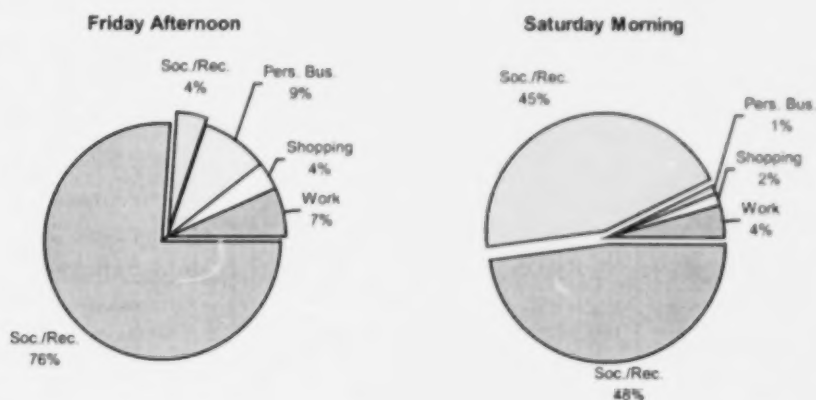
The trip purpose breakdown at Lions Bay is shown in the following chart.² Social/recreational trips accounted for about half of the traffic. However, work-related travel and shopping/personal business trips were also significant -- each accounted for about 25 percent of trips.



1. *Whistler Comprehensive Transportation Study*, Ecosign Mountain Resort Planners and Reid Crowther & Partners for the Resort Municipality of Whistler, 1997.
2. The survey was carried out on Thursday, July 6th and Friday, July 7th, 1989.

A 1989 survey carried out on Highway 99 north of Squamish showed social/recreational travel at 80 to 85 percent of total traffic for Friday afternoon and Saturday morning during the ski season.¹ The variability in trip purpose mix is apparent from the following overview of travel during the Friday and Saturday survey periods.

Trip Purpose in March, 1989 – Northbound Traffic



Virtually all of the trips captured in the 1991 survey were destined for Whistler, with less than one percent destined for Lillooet and points beyond. Trip origins were distributed as shown in the following table. Taken together, Vancouver and the North Shore accounted for about 60 percent of trip origins.

Distribution of Trip Origins March 1991 Survey at Squamish

Origin	Percent of Trips
Van. Island and the Gulf Islands	1
City of Vancouver	38
Burnaby and New Westminster	5
Richmond, Delta and Surrey	13
Port Moody and Port Coquitlam	3
North and West Vancouver	23
Fraser Valley and Hope	3
Squamish	9
Other Canada	1
U.S. Northwest States	3

1. This survey covered northbound travel between 3:00 p.m. and 6:00 p.m. on Friday March 15 and between 8:00 a.m. and 11:00 a.m. on Saturday March 16, 1989. The survey was carried out near the Cheekye River Bridge, about 10 kms. north of Squamish (*Squamish-Whistler Highway Planning and Pre-Design Engineering Study*, G.D. Hamilton Associates Consulting Ltd., 1991.) At the time of the survey, the Duffey Lake section of Highway 99 had not yet been paved.

Tourism and travel surveys also provide an indication of where recreational trips originate.

In 1995/96, Tourism BC conducted a survey of travellers who make at least one overnight stay in the Province. Based on the results of that survey, the following table shows the geographic distribution of the Whistler market and highlights the importance of the Lower Mainland and the northwest states.¹ Although the survey data does not provide a state-by-state breakdown for Whistler visits, Washington is a dominant source, as evidenced by the fact that about 45 percent of all U.S. visitors to B.C. are from the State of Washington.²

Trip Origin for Visitors to Whistler

B.C. Residents		Out-of-Province Visitors	
Place of Residence	% of B.C. Visitors	Place of Residence	% of Non-B.C. Visitors
GVRD	71	Western Canada	7
Vancouver Island	14	Other Canada	14
Northern Interior	3	Northwest U.S.	44
Southern Interior	12	Other U.S.	13
		Asia/Pacific	14
		Europe	8
		Other Overseas	1

Information compiled by the Whistler Resort Association and its members provides further insight into the Whistler travel market. The following chart shows the regional breakdown of Whistler's hotel market.³ It is important to note that this data represents room nights rather than number of visitors. B.C. residents, for example, might be expected to stay in Whistler for a shorter time than European visitors. As a result, a given number of room nights sold to B.C. residents might represent a larger number of trips to and from Whistler than the same number of room nights sold to visitors from Europe. Nonetheless, the chart highlights the fact that more distant markets take on increased importance during the winter months, and consequently airport connections become more important during the winter season.

1. *The Report on Visitors to Whistler - BC Visitor Study*, Tourism BC. The survey covered visitor activity throughout the year.
2. 1998 estimate of overnight visitor volume by market origin, from Tourism BC.
3. Business Performance Statistics published by the Department of Research, Whistler Resort Association. Summer figures are for the summer of 1998 while winter figures are for the winter of 1998/99.



The origin-destination surveys that were carried out by the Ministry about ten years ago made it clear that work-related travel was an important part of the traffic load on the highway. Commuting in the corridor takes many forms. For example, an increasing number of people live in Squamish in order to take advantage of relatively low housing costs while commuting to work on the North Shore (e.g. at Lions Gate Hospital or BC Rail) or in downtown Vancouver. Others live in Squamish and Pemberton and commute to Whistler for work in the recreation, accommodation and service industries, often with a travel subsidy from their employers. In addition, a number of professional and managerial workers live in Whistler and commute to Pemberton. There is also a considerable amount of long-distance commuting (e.g. from the Lower Mainland to Whistler and Pemberton). In this case, workers generally commute once a week and maintain two residences. As an indication of the extent of commuter travel in the corridor, close to 30 percent of Squamish residents who are in the work force commute to the Lower Mainland or to Whistler.

The following table shows the number of commuters who travel between communities in the corridor.¹

1. This information is drawn from the 1996 Census, and is based on a 20-percent sample of Census returns.

Commuter Travel in the Highway 99 Corridor

Residence	Place of Work						Corridor Commuters
	GVRD	Squamish	Whistler	Pemberton	Lillooet	Elsewhere in the SLRD	
GVRD		265	350	30	10	30	685
Squamish	1,025	3,880	605			165	1,795
Whistler	215	35	3,855	80		10	340
Pemberton	10	10	245	150			265
Lillooet	10				650		10
Elsewhere in the Regional District	95	95	235	335		25	760
Corridor Commuters	1,355	405	1,435	445	10	205	

Although some commuters make the return trip once a week, most travel to and from their place of work every weekday. If all commuters made a daily trip between their home and the community they work in, this would lead to the following commuter traffic load on Highway 99 each weekday morning.¹

Approximate Weekday Morning Commuter Travel in the Highway 99 Corridor

Link	Northbound	Southbound	Total
Vancouver - Squamish	645	1,260	1,905
Squamish - Whistler	985	45	1,030
Whistler - Pemberton	110	275	385
Pemberton - Lillooet	0	10	10

Party Size

Party size and composition is one of the factors that determines how people travel. The bus from Vancouver International Airport to Whistler, for example, might be more attractive than a rented car for a party of two adults but less competitive for a family travelling with two children.

The Ministry of Transportation and Highways conducted a vehicle classification/occupancy survey on Highway 99 in March of 1999. Results for the survey station located 10 kilometres north of Squamish are summarized in the following table. The shift to higher vehicle occupancies on weekends is readily apparent from this data. Where 50 to 70 percent of drivers travel alone on weekdays,

1. These estimates do not include commuter trips from "elsewhere in the Regional District" since no information is available on which section of Highway 99 is used by those commuters. For example, the 235 people who commute to Whistler from elsewhere in the Regional District could live either north or south of Whistler.

only 25 to 35 percent travel alone on weekends. The survey results also indicate that party size remains essentially unchanged throughout the day.

Vehicle Occupancy North of Squamish (March 1999)

Period	Number of Occupants in Cars, Pickup Trucks and Vans				Weighted Average Occupancy ¹
	Driver Only	2 Occupants	3 Occupants	4 or more Occupants	
Wednesday nb					
Morning (7 – 9)	49	32	9	4	1.7
Mid-day (12 – 1)	41	36	8	7	1.8
Afternoon (4 – 7)	53	29		6	1.5
Wednesday sb					
Morning (7 – 9)	69	20	1	1	1.3
Mid-day (12 – 1)	55	31	3	1	1.4
Afternoon (4 – 7)	48	38		4	1.6
Saturday nb					
Morning (7 – 9)	27	50	13	6	2.0
Mid-day (12 – 1)	28	48	13	7	2.0
Afternoon (4 – 7)	30	48	10	7	1.9
Saturday sb					
Morning (7 – 9)	39	40	7	6	1.8
Mid-day (12 – 1)	34	48	8	3	1.8
Afternoon (4 – 7)	25	54	11	5	1.9

The B.C. Visitors Survey conducted by Tourism BC found that visitors to Whistler from outside the Province travelled in smaller groups than visitors from within B.C. The average travel party size for non-residents was 2.2 persons, compared with 3.2 for B.C. residents. About 75 percent of out-of-province visitors travelled in parties of 1 or 2, compared with 50 percent for B.C. resident visitors.

Mode Choice and Non-Auto Travel

Rail, bus, ferry and air transport play a significant role in the corridor. This is apparent from the following estimates of total trip volume by mode.² As noted, the rail and marine markets have been weak over the last ten years, and both of those modes have lost market share. On the other hand, bus volume is reported to be increasing at a rate of about 15 percent per year.

1. Assumes that vehicles carrying "4 or more passengers" are actually carrying four passengers.
2. The traffic volume shown for rail is the total number of passengers carried on the North Vancouver-Lillooet section of the *Cariboo Prospector* service. Traffic on the BC Rail *Royal Hudson* steam train, the *Whistler Explorer*, and the *Pacific Starlight* dinner train are not included because these services are considered to be attractions rather than transportation services.

Approximate Annual Passenger Volume

Mode	Services	Approx. Annual Volume	Growth
Rail	The BC Rail <i>Canboo Prospector</i> .	45,000	Volume has declined over the last 10 years.
Bus	Greyhound, Perimeter and charter operators.	600,000+	Strong growth in both summer and winter markets.
Air	Primarily chartered flights.	6,000	
Autos, pick-up trucks and vans	North of Horseshoe Bay Based on an AADT of 14,000 and avg. veh. occupancy of 2.	10,000,000	
	North of Squamish Based on an AADT of 7,000.	5,000,000	3½ to 4 percent per year.

These figures point to the following traffic share for rail, bus and auto. As shown, rail accounts for less than one percent of travel in the corridor while bus carries six percent or more of the total.

Approximate Market Share by Mode (Average Year-Round)

	On the Horseshoe Bay – Squamish Segment	On the Squamish – Whistler Segment
Rail	0.4 percent	0.8 percent
Bus	6	11
Auto	93	88

As discussed later in this section, the bus mode's share of the market may be as high as 8 percent between Horseshoe Bay and Squamish and 15 percent between Squamish and Whistler.

The 1995/96 Tourism BC travel survey found that 92 percent of B.C. residents and 83 percent of out-of-Province visitors to Whistler were travelling by car, truck or van.¹

The share of the market that is carried by the non-auto modes is highest in the winter months. Figures compiled by the Whistler Resort Association indicate that 40 percent of skiers travel by bus while one percent travel by rail. The split of traffic

1. *Visitors to Whistler*, Tourism BC, based on surveys carried out in 1995 and 1996. This survey was confined to trips that include an overnight stay in B.C.

between modes is summarized in the following table.¹ The dominant modes are highlighted for each segment of the market.

Mode Choice for Skiers at Whistler

Mode	Percent Mode Split by Market							All Markets
	Lower Mnd.	Ontario	Wash.	Calif.	Eastern U.S.	Britain	Japan	
Plane and bus	1	31	1	36	43	67	86	37
Plane and Rental Car		44		40	43	15	8	18
Plane and Private Car	1	17	1	16	10	15	7	8
Private Vehicle	87	5	88	4	1	1		31
Bus	10		5		2	1		3
Rental Car	2	3	5	1		1		2
Train			1	3		2		1

A number of observations can be drawn from the table.

- About 40 percent of skiers arrive by bus.
- As expected, the private car is the dominant mode of travel from the Lower Mainland and the State of Washington with 85 to 90 percent of the market.
- Visitors from Ontario, California and the eastern United States make heavy use of rental cars and could be target markets for bus, rail and air service to Whistler.
- Bus is most attractive to offshore visitors.
- Judging from the strong market share for bus, it appears that many visitors from the U.S. and overseas travel directly from Vancouver International Airport to Whistler without stopping in Vancouver.

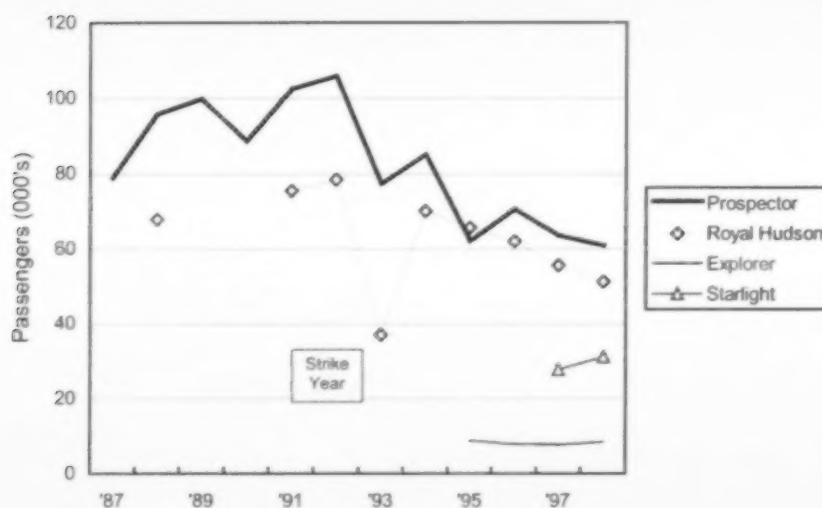
Travel by Rail

Traffic volume on BC Rail's passenger services has been falling for the last several years. This decline could result from any of several factors including the age of the equipment, problems with service reliability, or changes in the travel market. As shown in the following chart, BC Rail carried about 105,000 passengers on its *Prospector* service in 1992. By 1998, when the *Prospector* and *Explorer* were carrying the traffic that had previously been handled on the *Prospector* alone, that volume had fallen by 35 percent to about 69,000 passengers. The same trend is apparent for the *Royal Hudson* steam train. One exception to the declining rail

1. This survey is conducted by the Whistler Resort Association throughout the winter season and includes day skiers as well as those who are staying overnight in Whistler. The survey is carried out in restaurants and cafeterias on the ski hills by roving surveyors and does not represent a controlled sample. In reporting survey results, the Association does not provide information on the number of visitors from each market area. Figures are for the winter of 1998/99.

market is the *Pacific Starlight* dinner train that was first operated in 1997. Like the *Royal Hudson*, the dinner train is an attraction rather than a transportation service and does not affect highway travel or operations.

Annual Ridership on BC Rail Passenger Services



BC Rail strengthened its position in the Whistler market in 1999 with a 60-percent increase in the first six months of the year. As shown in the following table, they lost ground in other corridor markets.

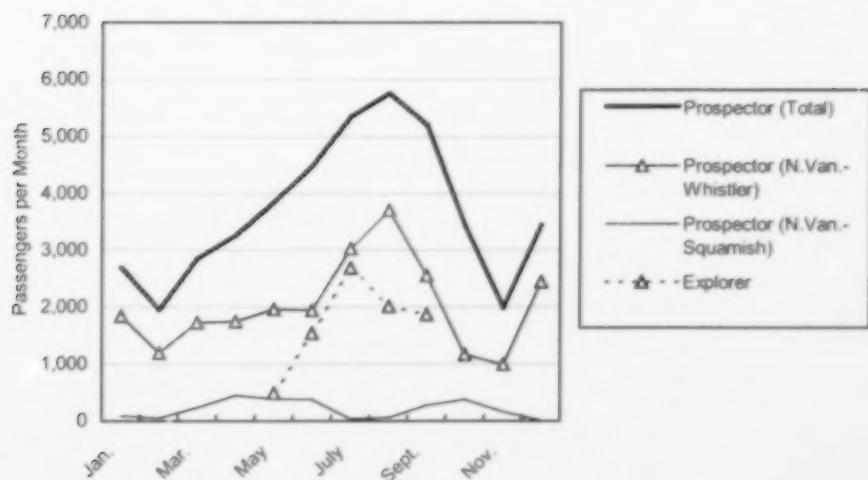
Rail Traffic Increases for Selected Community Pairs

	North Van. - Squamish	Squamish - Whistler	North Van. - Whistler
Jan. - June, 1998	1,593	181	10,394
Jan. - June, 1999	1,464	11	16,820
Percent Change	-8%	-94%	+62%

Rail travel is oriented towards the summer months at the present time. This is apparent from the following chart showing seasonal travel patterns for the *Prospector* and *Explorer* trains. Three sets of figures are shown for the *Prospector*:

1. The total number of passengers travelling on the North Vancouver-Lillooet section of the line.
2. Passengers travelling between North Vancouver and Whistler.
3. Passengers travelling between North Vancouver and Squamish.

Seasonality of Rail Travel -- 1998



The seasonal pattern for North Vancouver-Squamish trips reflects the fact that school field trips account for most of this travel. These groups generally use BC Rail for the northbound trip but return to Vancouver by bus.¹

BC Rail completed a survey of passengers on the *Prospector* in the spring of 1992.¹ Although the market has undoubtedly changed since the survey was carried out, the

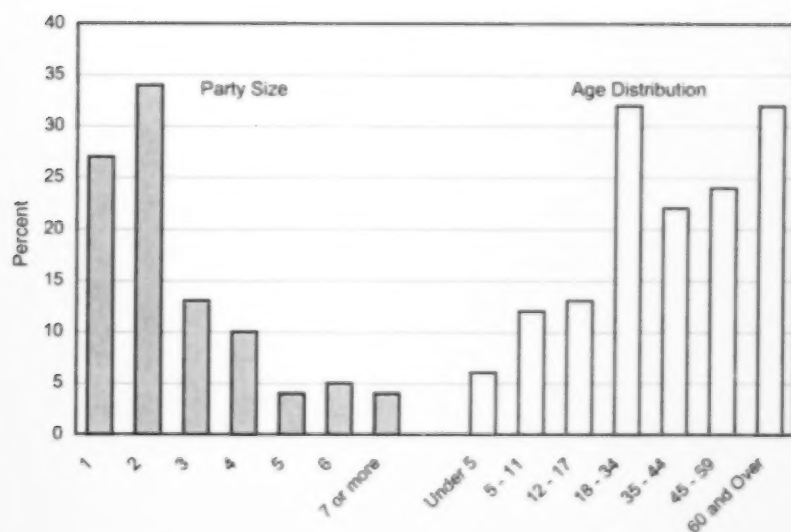
1. About 90 percent of trips between North Vancouver and Squamish are in the northbound direction.

findings provide an indication of who travels by rail in the corridor and why they select rail over the alternatives that are available to them.

Party size and age distribution are shown in the following chart. As indicated, more than one quarter of passengers were travelling alone. Mean party size was 2.6.

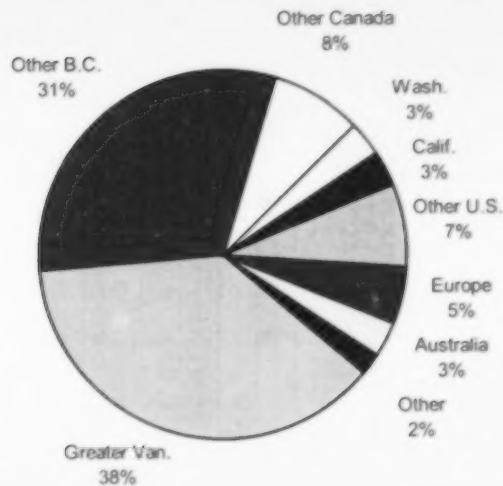
1. The survey covered 665 passengers on two *Cariboo Prospector* trips in the spring of 1992. A similar survey was carried out on the *Royal Hudson*. (B.C. Rail Passenger Survey, Angus Reid Group, Inc. for BC Rail, August 1992.)

Group Size and Age Composition



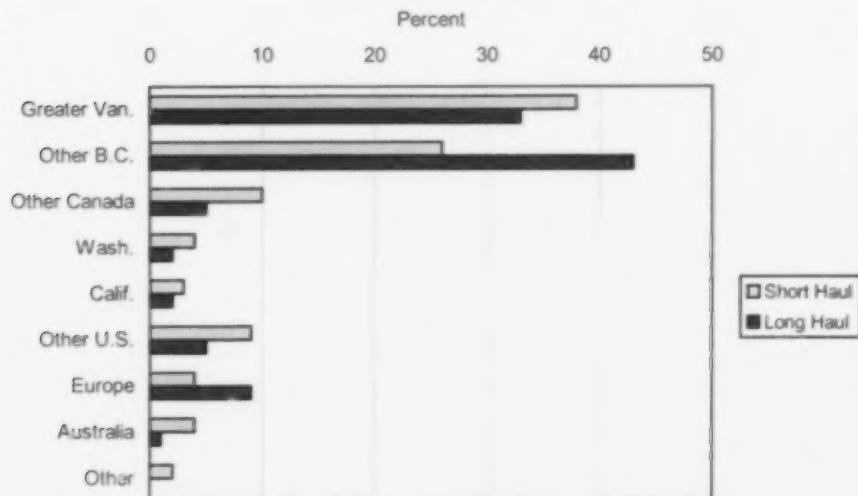
Close to 70 percent of passengers were B.C. residents, and more than half of those passengers were from the Greater Vancouver area. About one quarter of *Prospector* passengers live outside Canada – mainly in the United States. However, Europe, Australia and other offshore countries account for about ten percent of the total.

Place of Residence



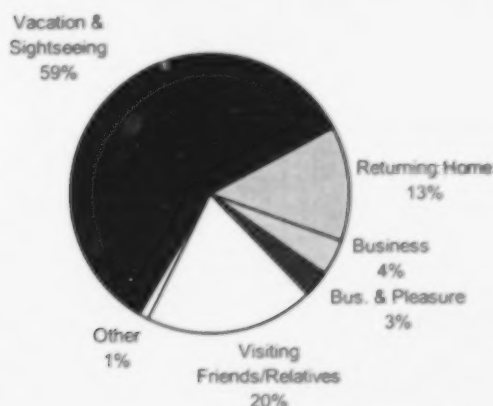
As shown below, there are some significant differences in the "place of residence" pattern for short-haul and long-haul trips, where short-haul trips start and end at points south of Lillooet. Most B.C. residents from outside the Greater Vancouver area are long-haul passengers. The same is true for visitors from Europe. On the other hand, most visitors from the U.S. and Australia are short-haul passengers who do not travel beyond Lillooet.

Place of Residence



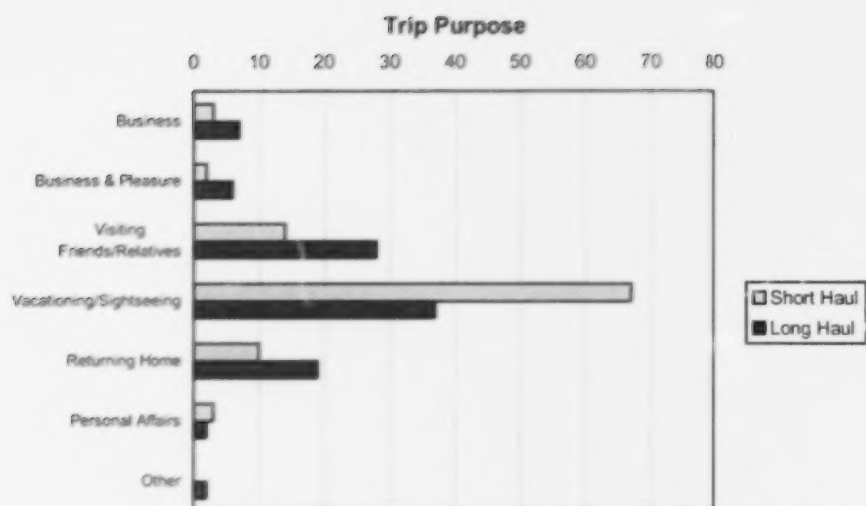
About 60 percent of passengers were travelling on the *Prospector* as part of a vacation or sightseeing trip.¹ Tourist traffic has increased in importance since the survey was carried out, and BC Rail staff believe that tourists now account for about 85 percent of passengers on the *Prospector*.

Trip Purpose for Rail Passengers



As with place of residence, there are significant differences in the trip purpose pattern for short-haul and long-haul passengers. This is apparent in the following chart. Most passengers who were on vacation or sight-seeing trips did not travel beyond Lillooet. On the other hand, the majority of passengers who were travelling for other reasons were long-haul passengers.

1. About 13 percent of respondents to the survey showed "returning home" as the purpose of their trip. For many of those passengers the trip home could be the last leg of a vacation trip. If this is the case, the vacation component of the trip purpose mix would be higher than 60 percent.



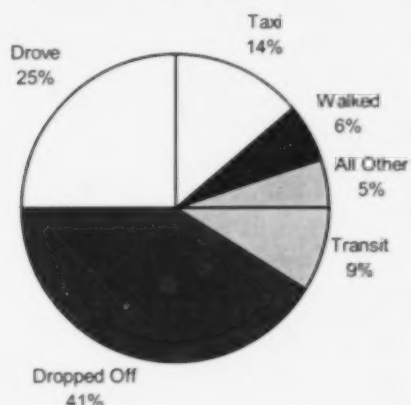
The Angus Reid survey also explored passenger preferences and the service characteristics that were most important to them. As shown in the following table, the response shows that access and cost were important but secondary considerations. Most of the passengers who were then using the *Prospector* placed greatest importance on scenery, reliability and relaxation. The response also makes it clear that travel time was not an important consideration for most passengers.

Factors Considered when Deciding to Travel by Rail

Response	How easy is it to access rail.	The cost involved.	How relaxing the mode is.	How fast you can get there.	The level of comfort.	Reliability and dependability of the mode.	En route scenery.
1 I don't consider this at all.	11%	11%	5%	13%	3%	3%	4%
2	3	2	1	7	2	2	1
3	5	5	3	11	4	3	4
4 Is an avg. consideration.	24	27	13	28	19	13	12
5	14	12	13	15	15	11	11
6	10	13	25	12	27	21	15
7 Is a major consideration	31	28	40	13	29	46	52

The survey showed that 60 to 70 percent of passengers drove to the station or were dropped off at the station. As shown in the following chart, significant numbers used taxis and transit to reach the station at their trip origin. Unfortunately, data that is available from the survey does not provide separate information for access to the North Vancouver station.

Access to Rail Stations



Once again, information drawn from this survey must be used with care since patterns and preferences may have changed since 1992. Nonetheless, the data provides useful insight into the nature of rail travel in the corridor.

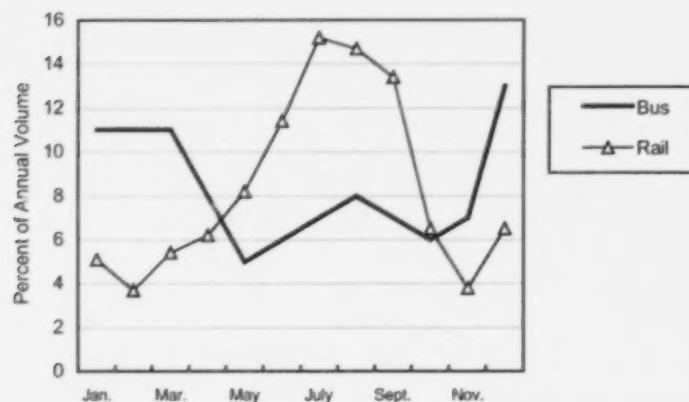
Travel by Bus

1. Unfortunately, the data that is available from the survey does not provide separate information for access to the North Vancouver station.

No survey data is available for bus travellers and consequently it is not possible to construct a detailed profile of bus travel in the corridor. However, some general observations can be made.

- Bus volume is considerably higher than previous estimates and is increasing rapidly. Discussion with operators indicates that more than 600,000 passengers per year travel by bus in the corridor, and total volume may be as high as 900,000 passengers per year.¹ The volume carried by scheduled carriers is in the order of 400,000 to 500,000 passengers per year. Operators report that the industry has experienced growth rates of 15 percent per annum in recent years.
- The heaviest bus traffic is concentrated in the winter months. However, the summer market is expanding and seasonality is expected to be less severe in the future. As shown in the following chart, the seasonal pattern for bus travel is entirely different from the existing rail travel market.²

Seasonality of Bus Travel



- The scheduled bus service from Vancouver International Airport is aimed at the Fully Inclusive Tour (FIT) market – people who are travelling on a tour package but are doing so on their own or in a small group without a tour guide. For roughly 60 percent of passengers, the bus trip has been purchased as part of a package.
- U.S. and Australian passengers are the largest markets for the scheduled service from the airport. The South American market is growing, while Asian markets

1. A recent study estimated 1996 volume on scheduled routes to Whistler at 150,000 passengers, with 40,000 on charter trips (*British Columbia Intermodal Passenger Transportation Study*, IBI Group for Transport Canada, 1997). A more recent study estimated passenger volumes on scheduled services at 350,000 passengers per year (*An Air Transport Vision for the Whistler/Pemberton Area*, McNeal & Associates for Prime Air, Inc., 1998).
2. The seasonal pattern for bus travel is from *British Columbia Intermodal Passenger Transportation Study*, IBI Group, 1997. In discussion with bus operators, they indicated that volume during the summer months has strengthened to the point that the decline in the shoulder and summer seasons is less severe than indicated in the chart.

are in decline. (Japanese tour companies tend to charter buses rather than use a scheduled service.)

- The scheduled service from downtown Vancouver also handles a large number of out-of-Province travellers. Most of these passengers apparently travel directly from Vancouver International Airport to Pacific Central Station on the airport shuttle without making an overnight stop in Vancouver. Cost is one of the factors behind their decision to take the extra time to travel downtown to connect with the Greyhound service rather than using Perimeter's airport-Whistler service. It is also one of the reasons that southbound traffic on the Greyhound service is heavier than northbound traffic.
- Mid-week school trips are the largest single market for charter bus trips to Whistler. Other charter markets include transfers to Whistler for conference attendees, local tours, and day trips to Whistler as one feature of the Vancouver stop-over on extended motor coach tours.

Travel by Ferry

No information is available on passengers using the Harbour Ferries service between Vancouver and Squamish. However, it appears that the market is declining (likely following the trend shown earlier for the *Royal Hudson* steam train), and consequently the operator is concentrating on shorter trips in the Vancouver area rather than the Squamish service.

Many of the passengers who use this service travel one way on the *Royal Hudson*, and consequently passenger characteristics for the *Royal Hudson* are one indication of the type of passenger who is attracted to the boat cruise. As shown in the following table, a 1992 survey of *Royal Hudson* passengers found that out-of-province visitors accounted for more than half of the market.¹

Place of Residence	Percent of Passengers
Greater Vancouver	37
Other B.C.	9
Other Canada	14
Wash., Oregon, Calif.	13
Other U.S.	13
Europe	8
Australia/New Zealand	3

Travel by Air

Current use of the scheduled airline service to Whistler is limited by the fact that it operates during the summer months only, is weather-dependent, and is relatively

expensive. Details on usage are not available. However, business and convention travel apparently account for most of the traffic at the present time.

Travel by Transit

Public transit plays a limited role in corridor transportation at the present time. The Squamish and Whistler transit systems move substantial volumes of passengers on Highway 99. However, these are local rather than regional trips.²

TransLink carries an average of 30 passengers per trip or a total of about 90 passengers per day between Horseshoe Bay and Lions Bay. That service is designed to cater to weekday commuter travel.

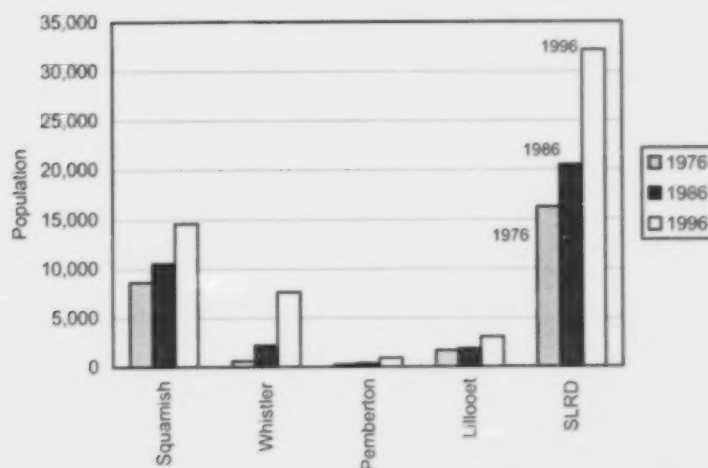
Population Growth

As seen in the discussion of traffic growth, travel in the corridor has been increasing at a rate that is equivalent to 3½ to 4 percent of current traffic volume. This increase is driven primarily by growth in the tourism/recreation sector and by the resulting growth in employment, population, and the construction and service industries in the corridor.

The total population of the Squamish-Lillooet Regional District increased by about 12,000 people or 55 percent between 1986 and 1996. Squamish, Whistler and Pemberton all experienced strong growth as the population of Squamish increased by 4,000, Whistler by 5,500, and Pemberton by 500. The following chart provides an overview of recent population increases.³

-
1. *B.C. Rail Passenger Survey*, Angus Reid Group, Inc. for BC Rail, August 1992.
 2. Trip purpose and travel time patterns for travel on the Whistler system are documented in *Transit 2010 – Transit Expansion Plan for the Whistler Transit System – 1997-2010*, BC Transit.
 3. Part of the population increase for Lillooet results from a change in municipal boundaries.

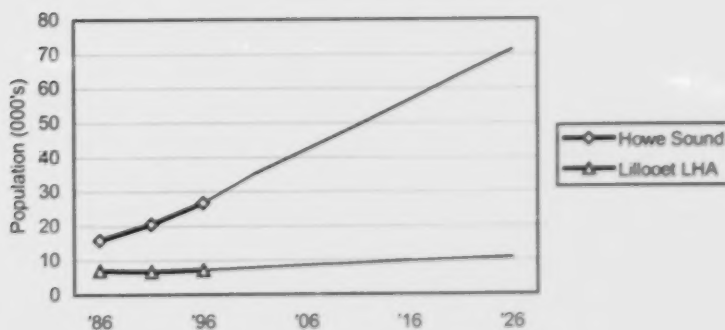
Population Growth in Corridor Centres



The overall increase that took place between 1986 and 1996 is equivalent to about 1,200 people per year or 3½ to 4 percent of current population – a rate that is consistent with traffic growth on Highway 99.

BC Stats produces population forecasts for administrative areas known as Local Health Areas or LHA's. There are two LHA's in the Squamish-Lillooet Regional District – the Howe Sound Local Health Area which covers the southern half of the regional district and includes Squamish, Whistler and Pemberton, and the Lillooet Local Health Area which includes the Village of Lillooet. Population projections for these areas are shown in the following chart.¹

Population Forecasts

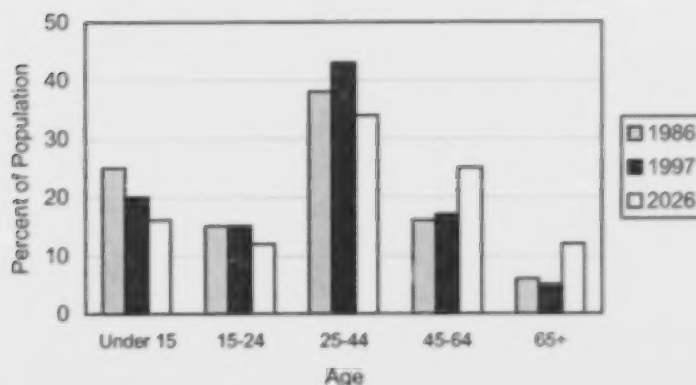


1. BC Stats population forecast 23 using the P.E.O.P.L.E. forecasting model.

With these forecasts, growth would be concentrated in Squamish, Whistler and Pemberton and total population would increase by about 1,600 people per year. This is equivalent to 4½ percent of current population and 2 percent in the last year of the forecast period.

As in other areas of the province, population is expected to "age" over the next 25 years. Where people over the age of 45 now account for 22 percent of population in the Howe Sound Local Health (including Squamish, Whistler and Pemberton), that percentage is expected to increase to 37 percent by 2025. Changes of that magnitude will affect travel needs and preferences over the longer term.

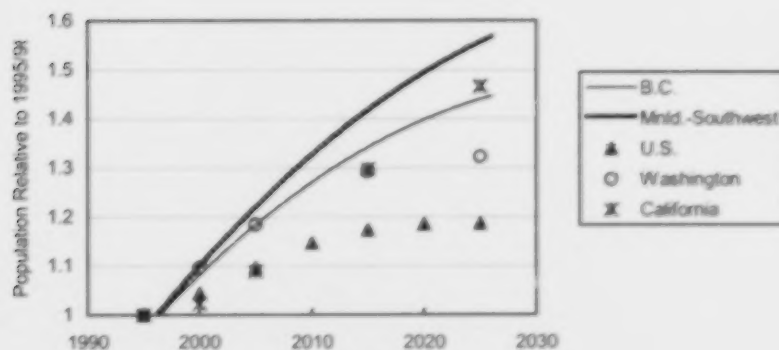
Population Restructuring - Howe Sound LHA



Travel demand in the corridor will depend in large part on growth in primary recreational markets. That growth will depend on many factors including the value of the Canadian dollar and the capacity of ski developments, tourist accommodation, golf courses and other components of the recreation industry. Apart from those factors, population growth in market areas will also be a driving factor. There is a wide divergence of expected growth among principal markets in North America. This is apparent from the following chart which shows growth projections of 20 percent over the next 25 years in the U.S. compared with more than 50 percent in the Lower Mainland.¹ Strong growth is expected in the Lower Mainland, Washington and California, all of which are key recreational travel markets for the corridor.

1. Population figures for B.C. and the Mainland-Southwest development region are from the BC Stats P.E.O.P.L.E. 23 projections and are also for population in the range of 15 to 64 years of age. Those for the U.S. are from the Bureau of the Census and are for population in the range of 18 to 64 years of age. 1995 is used as a base year for the U.S. figures and 1996 for B.C. forecasts.

Expected Population Growth



Together with the expected growth in corridor communities, these long-range forecasts are indicative of the travel demands that could be placed on the corridor over the next 20 to 25 years.

4. Strengths and Limitations of Existing Services

Some of the non-auto modes are experiencing strong growth. Others are struggling to become established or are experiencing a steady decline in market share. All of these developments reflect strengths and limitations in the service that is being provided, the equipment and infrastructure that are being used, the market development resources that are available to the carriers, and how well each mode matches travel needs.

The current mix of services reflects the characteristics of the modes. Some of those characteristics are inherent in the technology. For example, rail is not affected by highway congestion since it operates on a separate right-of-way. Other strengths relate to service design in the corridor. The standard of on-board service that has been a strength of BC Rail's service, for example, is a reflection of the Railway's approach to the market. BC Rail had the option of a "no-frills" service or, at the other extreme, a "premium" service that catered to a narrow market but made it possible to set fares at a high level.

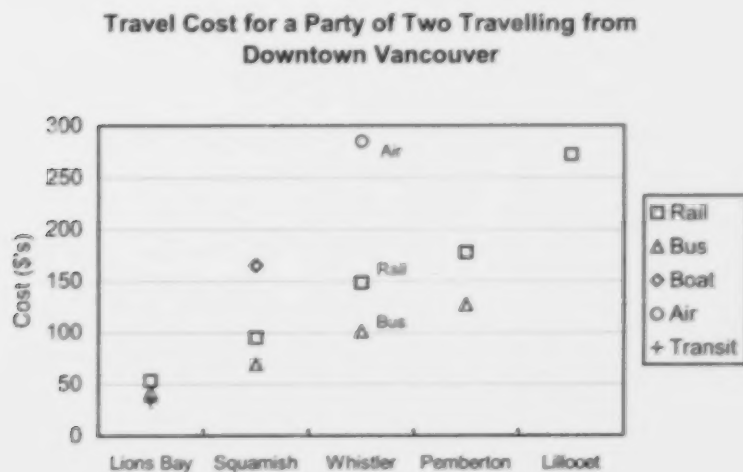
The inherent and service-specific characteristics of corridor services are summarized below.

Modal Strengths and Limitations

	Rail	Bus	Ferry	Air	Transit
Inherent Strengths	On-board comfort. Not affected by hwy. congestion. Least affected by weather.	Flexibility. Easy to add capacity. Can provide door-to-door service.	On-board comfort. Not affected by traffic congestion.	Travel speed. Not affected by traffic congestion.	Flexibility. Relatively easy to add capacity.
Corridor Service Strengths	Scenic route. On-board services.	Scenic route. Frequent service. Well developed mkt. Competitive fares.	Scenic route. On-board services.	Scenic route.	Responsive to travel demand and special needs.
Inherent Limitations	Limited track capacity. Freight has priority. High cost.	Affected by traffic congestion in Van. and on Hwy. 99. Bus image.		High cost.	Bus image.
Corridor Service Limitations	Old equip., poor reliability, high equip. maint. costs. Only 1 trip per day. Poor access to North Shore and Whistler terminals. Revenue does not cover costs. Slow speed.	Affected by highway delays and closures. Safety at on-highway flag stops.	Seasonal. Only 1 trip per day. Slow speed. Inter-dependence with BC Rail's <i>Royal Hudson</i> . Serves only Squamish.	Seasonal. Weather-dependent. Only 2 trips per day. Serves only Whistler.	No corridor or regional service. No service in Pemberton or Lillooet.

A forward-looking multi-modal strategy would capitalize on all of these strengths while addressing those service limitations that are most critical for the markets that are being targeted.

People account for many factors when they decide whether or how to travel, but time and cost are primary considerations. The following chart shows the array of costs that are available to non-auto travellers in the corridor. As in Section 2, this chart combines time and cost by adding \$10 per hour to out-of-pocket expenses. It also assumes that two adults are travelling together.¹ Figures are based on travel from downtown Vancouver and represent door-to-door travel with an allowance for the time and cost involved in reaching terminals.



As indicated, there are significant travel cost differences between the modes. Those differences are sufficient that each mode serves a distinct market. The differences are narrowed somewhat by discounting that is targeted at certain market segments. For example, Greyhound offers a 20-percent discount to commuters and regular users.

Every traveller has unique needs, preferences and sensitivities that lead to their travel decisions. These include comfort, convenience and reliability as well as travel time and cost. The following table illustrates the range of factors affecting travel, and indicates how the alternative modes might be ranked on a scale from 1 (lowest) to 4

1. A roadside survey carried out north of Squamish in March 1999 indicated that average occupancy for vans, pick-up trucks and automobiles is 1.8 people. A 1992 survey of passengers on BC Rail's *Cariboo Prospector* showed an average party size of 2.6.

(highest). These ratings apply to Vancouver-Whistler travel on scheduled services, and would be somewhat different for other origin-destination pairs.

**Rating of Mode Characteristics –
Travel from Downtown Vancouver to Whistler**

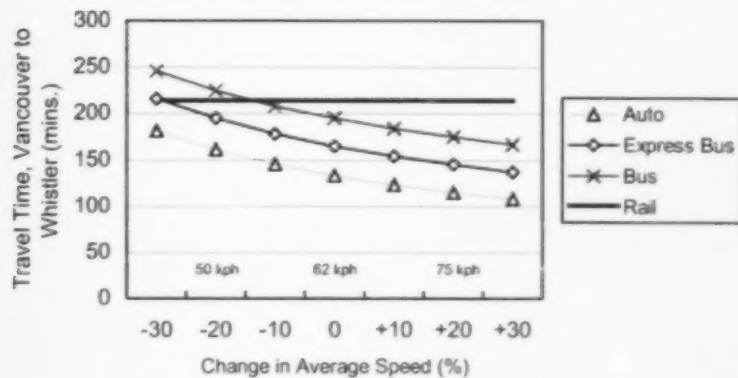
	Car	Bus	Rail	Air
Baggage	4	2	2	2
Transfers	4	2	2	2
Schedule Convenience	4	3	1	1
Reliability	4	4	2	1
Comfort	4	1	3	1
Cost	4*	3	2	1
Travel Time	3	2	1	4

* Based on the perceived cost of auto travel.

These ratings highlight the automobile's advantage over alternative modes. Traveller preferences vary with weather conditions, traffic volume, trip purpose, party size and many other factors. Nonetheless, the subjective ratings shown in the table are reflected in current mode choice, where the automobile now dominates travel between Vancouver and Whistler, followed by bus, rail and air. The auto's position is so strong that a substantial improvement in the competing modes (or a substantial deterioration in highway performance) would be needed to trigger a change in mode choice.

This study has not considered how highway traffic might increase in the future, what highway improvements might be made, or how those improvements would affect highway capacity, traffic congestion and travel times. However, any increase in traffic congestion will affect the non-auto modes. Unless bus priority measures offset the effects of traffic growth, travel time by bus will deteriorate at the same rate as auto travel times. At the same time, the relative performance of rail, air and ferry transport will increase. The sensitivity of inter-modal competition to changes in highway performance is illustrated in the following chart. Travel between Vancouver and Whistler is used for illustrative purposes once again. However, the general pattern applies to other origin-destination pairs in the corridor.

Effect of Hwy. Speed on Inter-Modal Competition



Average speed varies widely, depending on traffic volume and road and weather conditions. However, the current express bus schedule of 2 hours from downtown Vancouver to Whistler is representative of highway performance in the corridor.¹

With these assumptions, the chart indicates that travel time by rail becomes competitive with bus if average travel speed by road falls by as little as 10 percent. For express bus service, rail travel times become competitive once highway speeds have declined by 30 percent – from an average of 62 kph to about 45 kph. As indicated, average driving speed would have to fall by more than 35 percent in order for rail to become competitive with the auto in terms of travel time.

1. With a 2-hour schedule, average speed amounts to about 62 kilometres per hour. Times shown in the chart include an allowance for time spent travelling to and from stations and waiting for bus and rail departures. The following times are used to represent times from a trip origin in downtown Vancouver.

Illustrative Access and Waiting Times

	Auto	Bus	Rail
Walking time to parking lot.	10 mins.		
Travel time by foot, taxi or transit to departure station.		15 mins.	30 mins.
Time at stations for ticket purchase, baggage handling and waiting.		20 mins.	20 mins.
Time from station to final destination.		10 mins.	10 mins.
Total fixed time.	10 mins.	45 mins.	60 mins.

5. Current Development Plans

Rail, bus and air carriers are continually fine-tuning their operations to respond to traffic growth, competition, and the need to renew their fleets and facilities. Changes such as replacing or adding buses to an established fleet can represent a major capital investment for a bus company, for example. Changes of that sort have little effect on mode choice or highway operations. There are, however, a small number of active or planned developments that have implications for travel in the corridor and for the carriers that serve the corridor. These include:

1. Rebuilding the railcars that are used for BC Rail's *Cariboo Prospector* and *Whistler Explorer* services.
2. Building a transportation centre in Whistler Village.
3. Establishing scheduled air service to Pemberton.
4. Expanding public transit service in Whistler.

Each of these projects is outlined below.

1. Rebuilding the Railcar Fleet.

Although BC Rail operates four passenger services in the corridor, only one of these services – the *Cariboo Prospector* – provides a transportation service. The other three trains – the *Whistler Explorer*, the *Royal Hudson* and the *Pacific Starlight* – are tourist or entertainment attractions that have little or no transportation function.

BC Rail uses a fleet of eight self-propelled Rail Diesel Cars (or RDC's) for its *Prospector* and *Explorer* services. The cars were built in the 1950's and are now about 45 years old. Some were refurbished in the early 1980's, but that work was intended to extend their life by only 10 to 15 years to the mid-1990's.

With 45-year-old equipment, the Railway's car maintenance costs are high, reliability is a growing problem, and equipment breakdowns that force the Railway to put passengers on buses are becoming more common. For example, air conditioning failures during the summer months can create intolerable conditions on the train, leaving BC Rail with no alternative but transferring its passengers to chartered buses. The Railway is concerned about the added costs that are being incurred because of the age and condition of its equipment. It is also concerned about losing passengers and losing the support of tour operators who have featured BC Rail in their travel packages for many years.

-
1. The Railway has ten RDC's in its fleet, but only eight are operational. The *Prospector* usually operates as a 5-car train with seating capacity for 258 people. The *Explorer* operates with three cars and space for 202 people.

Without an investment in new or rebuilt equipment, the Railway will be forced to reduce or discontinue the *Cariboo Prospector* service – probably within the next five years. In the meantime, traffic volumes will likely decline as service reliability and the condition of the cars continue to deteriorate.

The Railway has investigated the possibility of acquiring new RDC equipment. No cars of this sort are being manufactured to North American standards at the present time. As a result the cost of a small order of 10 to 15 cars would be extremely high – likely in the order of \$5 million to \$6 million per car. This led BC Rail to conclude that the only feasible way of maintaining the service is to rebuild the existing equipment. As a minimum, they see a need to rebuild ten RDC's. This would allow them to keep eight cars in service throughout the rebuilding period and would leave them with an expanded fleet to handle peak traffic volumes and provide backup in the event of equipment failures. The fleet would remain at the 10-car level unless there was clear evidence that additional cars would pay for themselves.

BC Rail views the *Prospector* as a non-commercial service that is maintained as a matter of public policy, in part to serve communities that have poor access and are otherwise inaccessible during the winter months. The Railway is not prepared to cover the capital cost of new or rebuilt equipment in these conditions, and has approached the Province for capital funding and re-instatement of operating subsidies. From BC Rail's point of view, its shippers are subsidizing passenger services by about \$4 million per year, and the Railway recognizes that its freight customers would object strongly to any plans to finance passenger service improvements from freight revenue.¹

BC Rail attaches considerable urgency to the railcar rebuilding project. Tour operators develop and promote their packages more than a year in advance and need to know what services will be available, at what price, and with what standard of service and reliability about 18 months in advance. As a result they are now assessing BC Rail's "ability to deliver" for the 2001 travel season.

With an immediate start on the rebuilding project, the first car would be delivered in 2002 and the last car in the fall of 2003.

Building a Transportation Centre in Whistler.

-
1. Most of the operating losses are from the *Prospector*. The *Whistler Explorer* and *Royal Hudson* are likely operating at or near break-even levels and the *Pacific Starlight* at a profit. In addition to serving the Highway 99 corridor and the Cariboo region, the *Prospector* serves a number of small communities such as Shalath and Seton Portage which do not have year-round road access.

Whistler plans to build a transportation centre to accommodate scheduled inter-city buses, shuttle buses, public transit, and taxis and to complete that work by 2005. As initially proposed, the centre would include 12 bus bays, retail space, lockers, washrooms and a waiting area. The cost of the centre was estimated at \$1 million in 1997, and annual operating costs of \$80,000 were expected to be recovered through leases and locker fees.¹

The transportation centre and the concept it is based on are currently being reviewed and refined. The design and location of the complex will have implications for the quality of service that is provided by the carriers and the extent of shuttle bus activity in the Village.

3. Establishing Scheduled Air Service to Pemberton.

Prime Air Inc. is in the process of raising \$6 million in capital to establish a scheduled airline service to Pemberton from Vancouver and Seattle.²

Prime Air has adopted a four-phase development program. The first stage included construction of an airport terminal at Pemberton Airport at a cost of \$650,000³ and striking an agreement with Voyageur Airways to provide aircraft and manage flight operations.⁴ The remaining stages of the program include the following initiatives:⁵

Phase 2

- Gain Transport Canada certification for a landing approach system.
- Complete the terminal building.
- Establish a passenger reservation system.
- Negotiate agreements with feeder airlines.
- Start scheduled service from Vancouver.

Phase 3

- Install a precision landing approach system.
- Complete Customs facilities.
- Start scheduled service from Seattle.

Phase 4

-
1. *Phase 2 Report: Whistler Comprehensive Transportation Strategy*, Ecosign Mountain Resort Planners Inc. and Reid Crowther, 1998.
 2. Annual report filed with the U.S. Securities and Exchange Commission, for the year ending December 31, 1998. A Seattle-based investment banker has been retained to raise funds through a private offering (Prime Air Inc. newsletter, March 1999). Prime Air Inc. (the Canadian company) is a subsidiary of another company of the same name that is incorporated in the State of Nevada. Prime Air was originally incorporated as High Mountain Airlines Inc. in 1989 to establish scheduled service for the Whistler area.
 3. Annual report filed with the U.S. Securities and Exchange Commission for the year ending December 31, 1998.
 4. Voyageur Airways is based in Ontario and has a fleet of 16 aircraft, the largest of which are 46-seat deHavilland Dash 7's. Voyageur operates charter and air ambulance services and provides aircraft maintenance and airport services (Voyageur Airways web page).
 5. Newsletter published by Prime Air Inc., March 1999.

- Extend the runway from 4,000 feet to 5,500 feet.
- Begin service to Edmonton, Kelowna, Aspen, Atlanta and other locations.

Prime Air plans to move ahead with Phase 2 of its development plan as soon as funding is in place. As recently as the spring of 1999 it was targeting the end of 1999 for the start of scheduled service.¹

4. Expanding Public Transit Service in Whistler.

BC Transit and Whistler have adopted a transit development plan that responds to the rapid growth that has been experienced through the 1990's.¹ Ridership increased by 50 percent between 1992 and 1997, and strong growth is expected in the future. At the time the plan was developed, more than 1 million riders were expected to use the system in 1998/99, 2 million in 2002/03, and 2.5 million by 2010.

The proposed increase in service is outlined in the following table.

Service Expansion Envisioned in Transit 2010

Year	Fleet Size	Annual Hours of Service	Increase in Hours of Service	
			Annual	From 1996/97
1996/97	9	27,000		
1997/98	10	31,500	17%	17%
1998/99	15	45,500	44	70
1999/00	15	47,000	3	75
2000/01	18	59,000	25	120
2001/02	20	65,000	11	140
2002/03	28	83,000	28	210
2003 to 2010	36	106,000	27	300

Numbers have been rounded.

As indicated, fleet size and service hours are expected to increase by a factor of four over a period of about ten years. Capacity increases and service improvements will be concentrated on existing routes, and the service area will remain essentially unchanged. There is no provision for links to Squamish or Pemberton.

There are no specific plans for expansion of the Squamish system, improvements to the Horseshoe Bay-Lions Bay service, or new transit service in Pemberton/Mount Currie or Lillooet.

In addition to these four initiatives, there are a number of other development proposals that could have implications for the corridor. These include the following proposals.

1. Prime Air newsletter, March 1999.

-
- Plans to re-develop the Seabus terminal as part of waterfront redevelopment in downtown Vancouver. This terminal is already being used for a commuter ferry to Gibsons, and could become a hub for fast-ferry service to Squamish, Gibsons, Victoria and other points.
 - Plans to expand the commuter service to Gibsons with larger and faster vessels. As this service expands, the operator may be in a position to extend the operation to Squamish and other locations in Howe Sound.
 - Transit developments that improve accessibility to transportation terminals. These include: extensions to the Skytrain system; plans to add a third ferry to the Seabus fleet; and introduction of "rapid bus" service in the Richmond/Airport-Vancouver corridor, to be converted to Light Rail Transit or Skytrain between 2010 and 2015.²

With the exception of year-round scheduled air service to Pemberton, none of the current development proposals would have a substantial effect on the role or performance of the non-auto modes.

1. *Transit 2010: Transit Expansion Plan for the Whistler Transit System: 1997 – 2010*, BC Transit, 1997.
2. *Status of Transit Improvement Projects*, an overview prepared as background for the Vancouver/Whistler bid for the 2010 Winter Olympics, BC Transit, June 1998.

8. Summary and Conclusion

Non-auto travel plays a limited but significant role in the Vancouver-Lillooet corridor at the present time. On the section between Squamish and Whistler, for example, bus and rail now account for about 12 percent of travel other than local trips.

Apart from transit service to Lions Bay, there are only eight scheduled services in the corridor. Rail accounts for half of that total. However, of the four rail services, only the BC Rail *Cariboo Prospector* service from North Vancouver to Lillooet and Prince George performs a transportation function. The other three trains are seasonal attractions that draw visitors into the corridor but do not play a significant transportation role. Similarly, the Harbour Ferries service to Squamish is a seasonal attraction rather than a transportation service. Setting these aside, there are only four scheduled transportation services in the corridor:

1. Greyhound provides scheduled service from downtown Vancouver to Pemberton and Mount Currie. The current schedule includes seven daily departures from Vancouver during the winter months, plus an additional bus from Squamish to Whistler.
2. Perimeter Transportation operates from Vancouver International Airport to Whistler, with five scheduled departures per day during the summer months and eleven during the winter.
3. BC Rail's *Cariboo Prospector* is a daily service from North Vancouver to Lillooet, continuing to Prince George three times each week.
4. Whistler Air operates a scheduled floatplane service from downtown Vancouver to Whistler during the summer months.

There is also heavy charter bus activity in the corridor, with school trips to Whistler as the largest single charter market. Taken together, the scheduled and chartered bus companies move more than 600,000 passengers per year in the corridor and possibly as many as 900,000. The operators are experiencing strong growth as a result of an expanding travel market, effective marketing programs, relatively weak competition from the non-highway modes, and a reputation for safe, reliable service.

BC Rail moves about 60,000 passengers per year on the *Cariboo Prospector* service – down from about 105,000 in 1992. Roughly 45,000 of those trips are between points in the North Vancouver-Lillooet section of the corridor, including 30,000 to and from Whistler. The railcars that are used for this service are more than 40 years old and are close to the end of their practical service life. As a result, service

reliability has declined, maintenance costs are escalating, and operating losses are in the order of \$4 million per year.

Whistler Air's scheduled service has been operating for only two years and it is not yet clear whether the airline will be able to sustain that route. The service has limited capacity and, together with charter operations, total air travel in the corridor is now in the order of 6,000 trips per year.

Several factors limit non-auto travel at the present time. These include the following limitations.

Access

- Access to railway stations in North Vancouver and Whistler is poor.
- Travellers who arrive in Vancouver by air must stay overnight in Vancouver if they want to travel by rail in the corridor.

Mode Choice

- Rail service will be discontinued unless the fleet is replaced or rebuilt within the next five years.
- Air service is seasonal and limited.
- There are no marine transportation services in the corridor.
- There are few service options for commuters.

Service Quality

- Rail service is relatively slow, provides only one trip per day, and is becoming less reliable.
- As highway traffic increases, bus schedules and service reliability are being affected by congestion.

To the extent possible, BC Rail, the bus operators and the airlines are fine-tuning their operations to respond to traffic growth, competition and the need to renew their fleets and facilities. However, those efforts will have little effect on the more fundamental constraints on non-auto travel that are outlined above. There are, however, a small number of active or planned developments that have the potential to affect mode choice. These include the following projects and proposals.

- Rebuilding the BC Rail passenger fleet. BC Rail's equipment is near the end of its practical service life and the railway will be forced to discontinue its passenger service unless the railcars are rebuilt or replaced within the next two to five years. The *Cariboo Prospector* is a non-commercial service that is maintained as a matter of public policy. As a result, BC Rail is not prepared to cover the cost of equipment renewal, and has approached the Province for capital funding and re-instatement of operating subsidies.
- Building a Transportation Centre in Whistler. Whistler plans to build a transportation centre for buses and taxis by 2005. The transportation centre and the concept it is based on are currently being reviewed and refined. Its location

and design will have implications for the quality of service that is provided by the carriers and the extent of shuttle bus activity in the Village.

- Establishing Scheduled Air Service to Pemberton. Prime Air Inc. has built a terminal at Pemberton Airport and is in the process of raising capital for additional airport improvements and a scheduled airline service to Pemberton from Vancouver and Seattle. The company has been attempting to establish a service for several years, and it is not yet clear whether it will be succeed.
- Expanded Public Transit. BC Transit and Whistler have adopted a transit development plan that responds to the rapid growth in ridership that has been experienced in recent years. However, that expansion is focused on serving the local community rather than establishing new corridor links. At the present time there are no plans to improve the Horseshoe Bay-Lions Bay service or introduce new corridor services.

Contacts

Municipalities and the Regional District

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Steve Black, Manager, Transportation and Drainage, Resort Municipality of Whistler.

Bob McPherson, Resort Municipality of Whistler.

Bryan Kirk, Clerk-Treasurer, Village of Pemberton.

Carriers and Suppliers

Air

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Mike Quinn, President, Whistler Air Services.

Bus

Glen Broad, Passenger Operations Manager, Greyhound Lines of Canada Ltd.

R.J. (Rod) Comrie, Vice President, Maverick Coach Lines Ltd.

Michael K. Hall, Regional Manager, Safety and Driver Development, Greyhound Lines of Canada Ltd.

Lorne Richard, Operations Manager, Perimeter Transportation Ltd.

Marine

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Graham Banks, International Hovercraft Ltd., Northam, Southampton, United Kingdom.

Bjarne Boervan, Senior Manager, Kvaerner Fjellstrand, Finland.

Tom Bruusgaard, Marine Consultant and former harbour master of Squamish Harbour.

Giles Clark, Broker, Fast Ferry International, Kent, United Kingdom.

George Colquhoun, Chief Executive Officer, North Fraser Port Authority, Richmond, B.C.

Michael Corvey, Office of the Harbour Master, Vancouver Port Authority.

Ray Deardorf, Planner, Washington State Ferries, Seattle, Washington.

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Provincial Agencies

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Brian Dolsen, ADM Tourism and Corporate Policy, Ministry of Small Business, Tourism and Culture.

Les Dzbik, Project Planning Engineer, Ministry of Transportation and Highways.

Tom Kearns, Manager, Economic Analysis, Ministry of Transportation and Highways.

Jerry Gerrard, Data Program Coordinator, Ministry of Transportation and Highways.

Other Organizations

Alan Rice, Research Coordinator, Whistler Resort Association

Appendix 1
Comparative Travel Times and Costs

Exhibit I.1. Travel Time, Cost and Convenience -- Current Conditions

Downtown Vancouver to Squamish

Travel Time (minutes)	By Car				By Bus				By Rail				By Water			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Access																
Walling																
Travel																
Transfer																
Travel																
Transfer																
Total																
Convenience Rating																
Baggage																
Transfers																
Sched. Conv.																
Comfort																
Actual Cost (\$'s)																
Party Size																
Access																
Travel																
Transfer																
Travel																
Transfer																
Total																
Total/person																
Travel Time																
Total																
Total/person																
Perceived Cost (\$'s)																
Travel																
Time																
Total																
Total/person																

Notes:

Perceived cost of auto travel is taken as:

9.7 cents per km. Source:

CAA Driving Costs 1999 Edition for fuel, oil, tires and maintenance for a 1999 Chevrolet Cavalier.

The full cost of auto travel is taken as:

42.2 cents per km., again for a Chevy Cavalier, based on 18,000 kms. per year.

The distance to Squamish is taken as:

67 kms.

Value of travel time is taken as:

10 dollars per hour

Comfort and convenience factors are rated as:

Highest or most attractive = 3

Medium = 2

Least attractive = 1

Exhibit I.2. Travel Time, Cost and Convenience -- Current Conditions

Downtown Vancouver to Whistler

	By Car				By Bus				By Rail				By Air				By Water			
	Travel Time (minutes)				Travel Time (minutes)				Travel Time (minutes)				Travel Time (minutes)				Travel Time (minutes)			
Access	10	mins			15	mins			30	mins			15	mins			15	mins		
Waiting					20				20				20				20			
Transfer					150				154				30				180			
Travel																	20			
Transfer																	60			
Total					130	mins			10	mins			10	mins			305	mins		
Convenience Rating																				
Baggage	3				2				2				2				2			
Transfers	3				2				2				2				2			
Sched. Conv.	3				2				1				1				1			
Comfort	3				1				2				1				2			
Actual Cost (\$'s)																				
Party Size	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Access					\$5	\$5	\$5	\$5	\$10	\$10	\$10	\$10	\$5	\$5	\$5	\$5	\$5	\$5	\$5	\$5
Travel	\$53	\$53	\$53	\$53	18	36	54	72	31	62	93	124	125	250	375	500	40	80	120	160
Transfer																				
Travel					5	5	5	5					5	5	5	5	10	20	30	40
Transfer																	5	5	5	5
Total	\$53	\$53	\$53	\$53	\$28	\$46	\$64	\$82	\$41	\$72	\$103	\$134	\$135	\$260	\$385	\$510	\$60	\$110	\$160	\$210
Total/person	53	26	18	13	28	23	21	21	41	36	34	34	135	130	128	128	60	55	53	53
Travel Time	22	43	65	87	33	65	98	130	36	71	107	143	13	25	38	50	51	102	153	203
Total	\$74	\$96	\$118	\$139	\$61	\$111	\$162	\$212	\$77	\$143	\$210	\$277	\$148	\$285	\$423	\$560	\$111	\$212	\$313	\$413
Total/person	74	48	39	35	61	56	54	53	77	72	70	69	148	143	141	140	111	106	104	103
Perceived Cost (\$'s)																				
Travel	\$12	\$12	\$12	\$12																
Time	22	43	65	87																
Total	\$34	\$55	\$77	\$99																
Total/person	34	28	26	25																

Notes:

Bus times are 30 minutes shorter for express runs.

Perceived cost of auto travel is taken as

9.7 cents per km.

Source

CAA Driving Costs 1999 Edition for fuel, oil, tires and maintenance

for a 1999 Chevrolet Cavalier

The full cost of auto travel is taken as:

42.2 cents per km., again for a Chevy Cavalier, based on 18,000 kms. per year.

The distance to Whistler is taken as:

125 kms.

Value of travel time is taken as:

10 dollars per hour

Comfort and convenience factors are rated as:

Highest or most attractive =

3

Medium =

2

Least attractive =

1

Exhibit I.3. Travel Time, Cost and Convenience -- Current Conditions

Vancouver International Airport to Whistler

Travel Time (minutes)	By Rental Car				By Direct Bus				By Connecting Bus				By Rail*				By Air				By Water				
	30 mins.				15 mins.				15 mins.				60 mins.				30 mins.				30 mins.				
Access																									
Waiting																									
Travel																									
Transfer																									
Transfer																									
Transfer																									
Total																									
Convenience Rating																									
Baggage																									
Transfers																									
Sched. Conv.																									
Comfort																									
Actual Cost (\$'s)																									
Party Size																									
Access																									
Travel																									
Transfer																									
Transfer																									
Transfer																									
Total																									
Total/person																									
Travel Time																									
Total																									
Total/person																									

Notes: The cost of auto travel is based on a 4-day rental of a Chevrolet Cavalier, with the cost split between the trip to Whistler and the return trip to Vancouver International Airport.

With waivers and insurance, a 4-day rental is:

Fuel at 5.7 cents per kilometre

One way cost by rental car

Value of travel time is taken as:

Comfort and convenience factors are rated as:

Highest or most attractive = 3

Medium = 2

Least attractive = 1

* Requires an overnight stay in Vancouver. Time and cost of overnighing in Vancouver are not included here.

